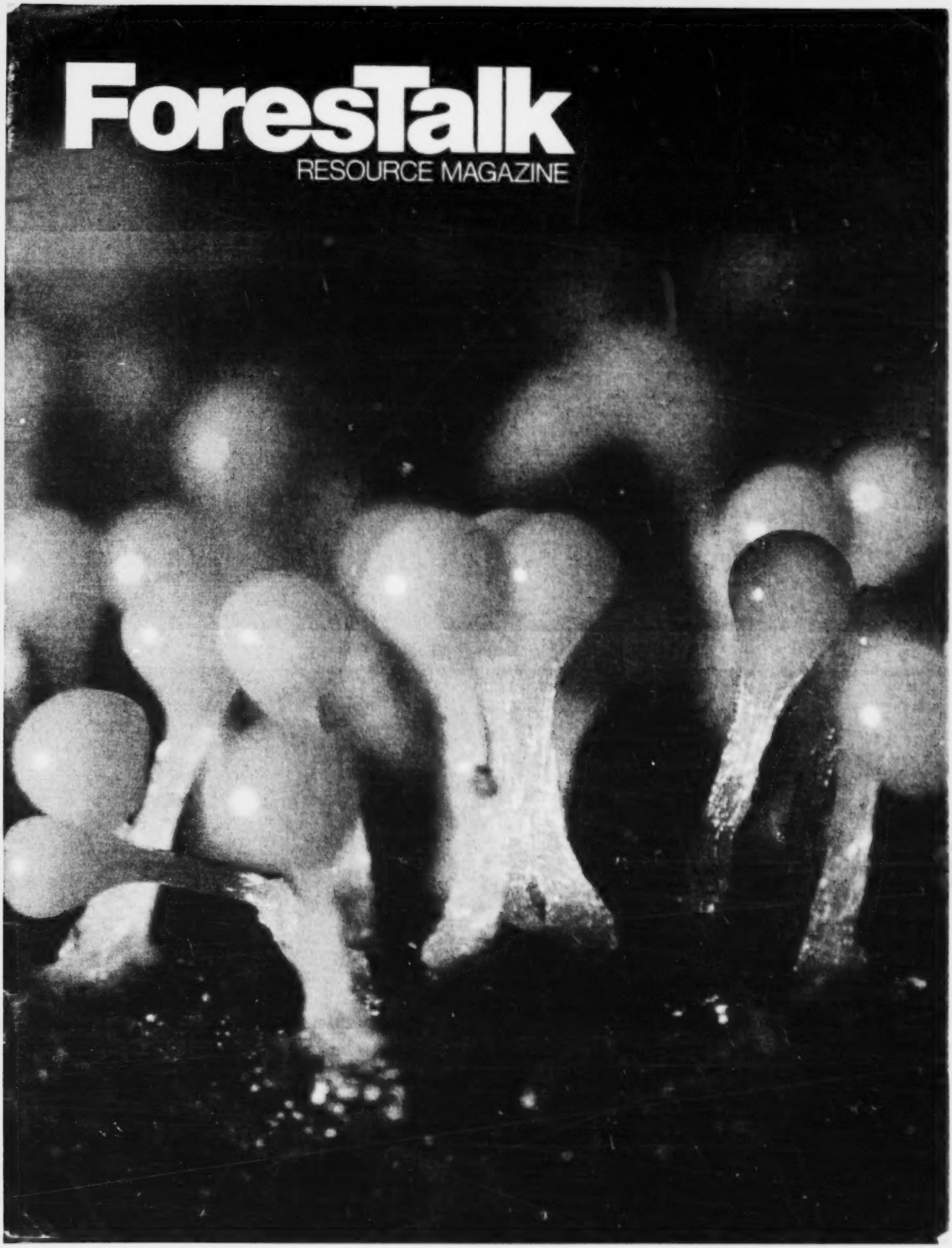
ForesTalk

RESOURCE MAGAZINE



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FEATURES

Cut Along the Dotted Line A review of the 'Coast Logging Guidelines', introduced to British Columbia five years ago, reveals the dramatic impact they have had on the practice of forestry in the province. by Cameron Young 6

Streamside Logging No two timber harvesting areas are the same. This is especially true when streams with fish habitat potential are involved. The considerations are many, the solutions must be tailor made. by Gord Price 14

Damaging Dead-heads Floating logs, stumps, trash and bleach bottles. Who's responsible for this water-borne garbage and what's being done about it? by Jean Sorensen 22

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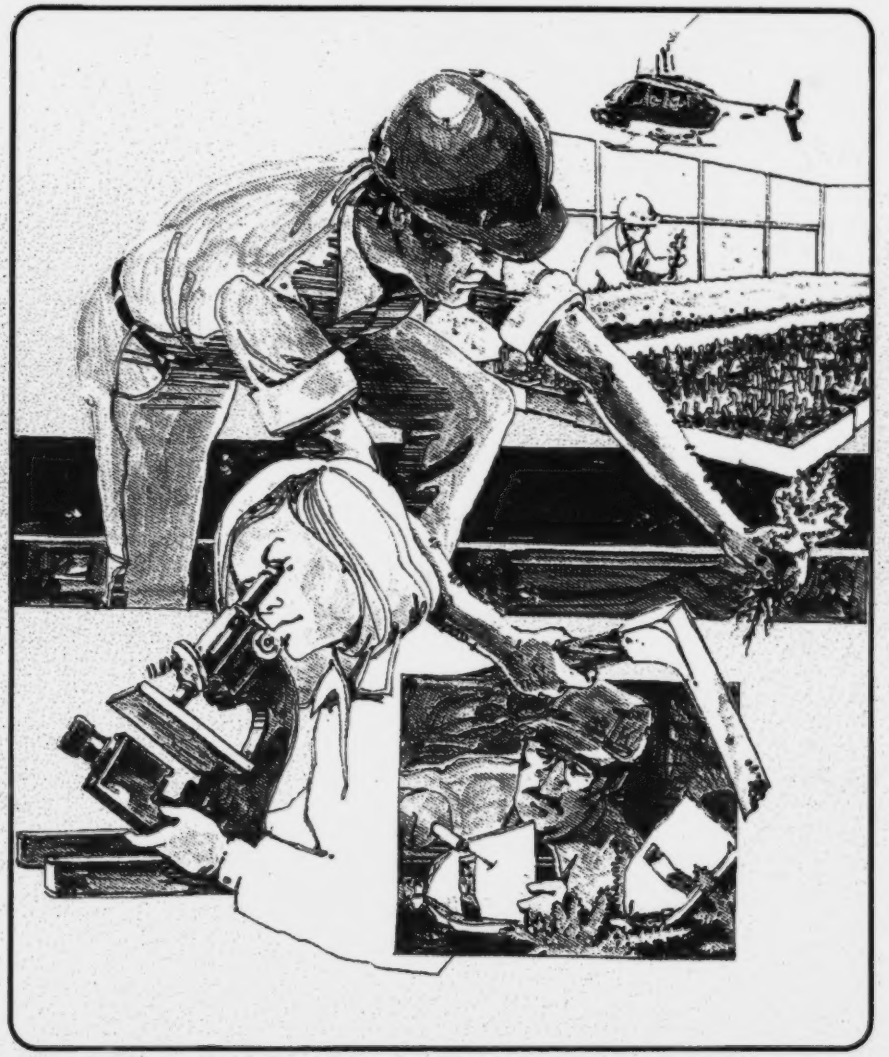
Cover photo by Enid Lemon.
Slime molds, animal or plant? Early in their life cycle they are mobile, leading zoologists to claim them as animals. Later, while they are stationary and producing spores, botanists classify them with the fungi. Look for them, in many colours, among decaying material on the forest floor.



Where to find us

A Brief Guide to the Ministry of Forests

By reading ForesTalk, you can probably appreciate the complexity of forest management in British Columbia and the number of people needed to carry this out. But when you or your organization need answers to a particular question or require a service, the Ministry can sometimes appear overwhelming. This brief guide provides a very basic outline of the main areas of activity and a list of addresses and phone numbers. We hope that it will assist you and make your contact with us pleasant and productive.

THE STRUCTURE

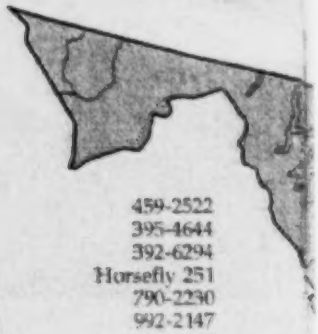
Each of the six forest districts outlined on the map has a head office which houses the professional and technical personnel required to administer the complexities of their district. Rangers are spread throughout the province in over a hundred locations and are the front line people. They are the backbone of the Ministry. Research Stations study and test the ideas and theories generated in the pursuit of forest management. Our nurseries provide the millions of seedlings necessary for our reforestation program.

Victoria is where the main headquarters are located. Here is where the policies and programs for province-wide forest management are finalized and administered. The Victoria operations house all the operational divisions and the executive. Each division is named according to its related activities. They are staffed by people who work in specific functions. The divisions are: reforestation, engineering, administration, personnel, valuation, special studies, resource planning, protection, inventory, research, accounting and information.

WHERE TO LOOK

District Offices and Ranger Stations are equipped to answer just about any question you may have. The best location, since the responsibilities are so closely related to local needs, is the Ranger Station nearest you. But the District office is equally qualified for these purposes. Anything from maps to applications for all purposes are available from these offices. Fire hazard information, industrial practices and locations, regulations, and all related information can be obtained by a phone call or a visit. You will be assured friendly and helpful assistance. Nurseries and Research Stations are available for educational group tours and can be contacted through the District office or the nearest Ranger Station.

Victoria Headquarters will also provide any answer you may need concerning our broad range of functions and services. Although it is best to contact the Ranger nearest you, you can receive the same attention in Victoria. The only differences are that the Ranger or District offices are more intimately related to the forest operation and the sheer size of the Victoria offices could cause some difficulty locating particular people. If the list of Victoria Headquarters phone numbers provided here does not connect you directly with the people you need, phone the Information Division.



VICTORIA

Accounting	387-3904
Administration	387-5291
Engineering	387-6640
Forest Valuation	387-5291
Information	387-5985
Inventory	387-6722
Personnel	387-5284
Protection	387-5965
Range	387-6656
Reforestation	387-3917
Research	387-6720
Resource Planning	387-1391
Special Studies	387-5111

DISTRICT OFFICES

Vancouver	668-2563
Prince Rupert	624-2121
Prince George	562-8131
Kamloops	374-4112
Nelson	354-4181
Williams Lake	392-6261

RANGERS (by District)

Vancouver District

Cultus Lake	858-9434
Hope	869-9961
Harrison Lake	796-2440
Mission	826-2485
Port Moody	461-7237
Squamish	898-3628
Sechelt	885-2034
Pender Harbour	883-2332
Powell River	485-4424
Lund	483-3414
Campbell River (North)	287-9135
Sayward	282-3323
Port McNeill (North)	956-3331
Port McNeill (South)	956-3331
Port Hardy	949-6423
Campbell River (South)	287-9135
Parksville	248-5715
Duncan	746-6183
	Local 246
Langford	474-1269
Lake Cowichan	749-3111
Alberni	724-3396
Tofino	725-3225
Pemberton	894-6311
Gold River	283-2215

Prince Rupert District

Burns Lake	692-7515
Queen Charlotte City	559-4476
Prince Rupert	624-2121
Terrace	635-6136
Kitwanga	849-5454
Hazelton	842-5377
Smithers	847-2217
Houston	845-7712
Bella Coola	799-5331
Southbank	694-3432
Lower Post	536-2289
Kitimat	632-2921
Stewart	636-2415

Cariboo District

Clinton	459-2522
100 Mile House	395-4644
Williams Lake	392-6294
Horsefly	Horsefly 251
Likely	790-2230
Quesnel (East)	992-2147
Quesnel (West)	992-2147
Riske Creek	Riske Creek 1Z
Alexis Creek	394-4215
Tatla Lake	Tatla Lake 1K

Kamloops District

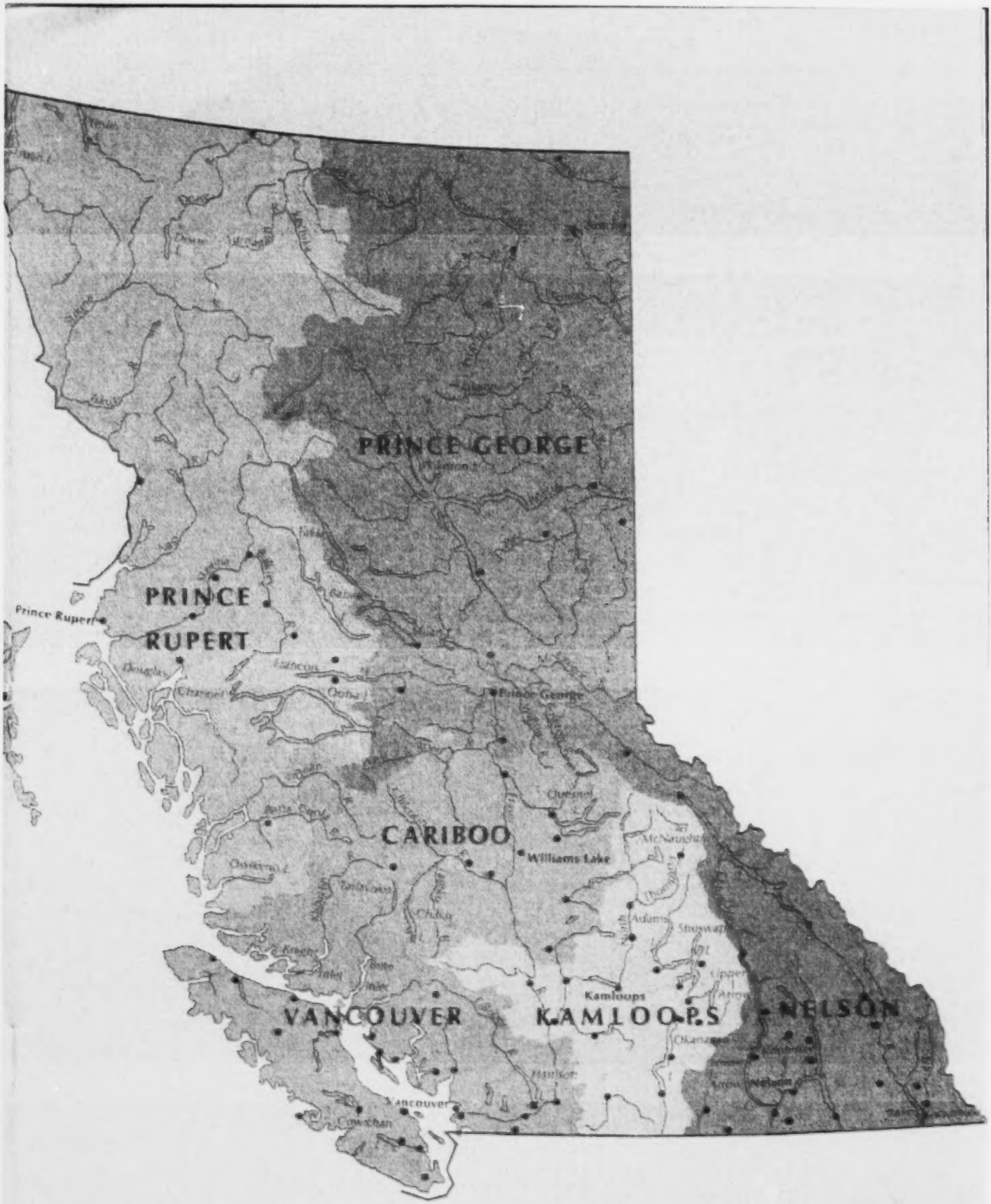
Lumby	547-2156
Clearwater	674-9155
Barriere	672-2156
Kamloops	372-5832
Chase	679-3228/9
Salmon Arm	832-7048/9
Sicamous	836-2262
Lillooet	256-7033
Vernon	542-4374/5
Penticton	492-2006 or 4285
Princeton	295-6988/9
Kelowna	765-5178
Ashcroft	453-2550
Lytton	455-2325
Merritt	378-4265
Blue River	673-8323
Enderby	838-7284

Nelson District

Invermere	342-6723
Fernie	423-6336
Golden	344-2762
Cranbrook (East)	426-3391
Creston	428-2030
Kaslo	353-2332
Lardeau	366-4416
Nelson	825-4711
New Denver	358-2313
Nakusp	265-4435
Castlegar	365-7455
Grand Forks	442-3831
Kettle Valley	446-2212
Canal Flats	349-5218
Mica Creek	834-7442
Fauquier	269-7331
Elko	529-7414
Cranbrook (West)	426-3391
Beaverdell	484-5612
Salmo	357-9411
Revelstoke	837-2010

Prince George District

McBride	569-2291
Valemount	566-4226
Prince George	562-4121
Fort St. James	996-8207
Dawson Creek	782-3004
Aleza Lake	966-2468
Vanderhoof	567-2244
Fort St. John	785-8177
Summit Lake	965-7721
Fort Nelson	774-6773
Hixon	998-4303
Chetwynd	788-9217
Mackenzie	997-3310


PRINCE GEORGE
PRINCE RUPERT
Prince Rupert
Prince George
CARIBOO
Williams Lake
Kamloops
VANCOUVER
KAMLOOPS
NELSON

Cut Along the Dotted Line

A look at Coast logging Guidelines

By Cameron Young

With its steep slopes and narrow valley bottom, the Mactush watershed is not an easy place to get to.

It is less than an hour's drive from Port Alberni, but the road is all hills, turns, and gravel. Yet there is something very important going on there.

As one of the first watersheds opened to logging after the Coast Logging Guidelines came into effect, the Mactush is a kind of proving ground for the logging principles contained in those guidelines. And one thing for certain: this new way of doing things takes some getting used to, both by the forest industry and the Forest Service.

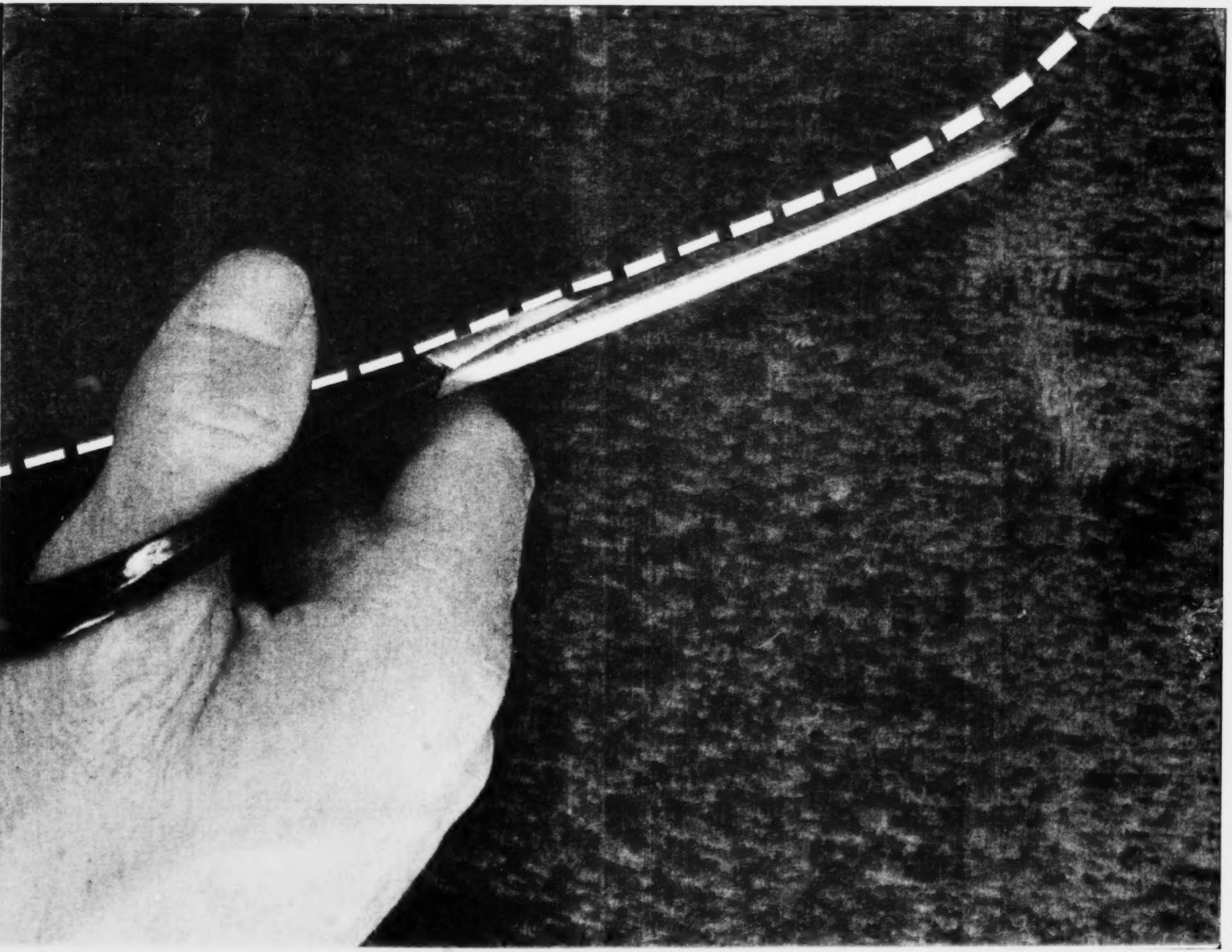
In September of 1972 all logging companies operating along the B.C. coast received a seven-page letter from the province's Chief Forester, a letter that was to alter dramatically both the philosophy and practice of forestry in B.C.

"If the forest industry wishes to continue its success as the prime user of British Columbia forests," the letter begins, "it must accept the need for maintaining an environment satisfactory and suitable to the needs of all British Columbians." The letter then goes on to outline, in 12 categories and 24 sub-sections, how logging operations should be modified to accommodate this environmental objective. And that was the birth of the Coast Logging Guidelines.

Five years later these guidelines, which were originally intended as an interim measure until a more complete resource strategy could be evolved, are still very much in effect.

But what were the conditions that prompted the Ministry of Forests to

photography by Peter Robin



"If the forest industry wishes to continue its success as the prime user of British Columbia forests, it must accept the need for maintaining an environment satisfactory and suitable to the needs of all British Columbians."

initiate the guidelines in the first place? Al Schutz, the man in the Vancouver Forest District with the responsibility of implementing the guidelines on Vancouver Island and the south coast, explains:

"The guidelines were a response to the growing public concern over the treatment the other resources in the province were receiving," he says. "Also, there was a general lack of knowledge of the requirements of those other resources, and we weren't getting the advice we needed from the other agencies that could enable us to do adequate planning."

"When the guidelines were introduced they brought into sharp focus the other demands of the forest."

Mike Wallace, an assistant ranger in the Port Alberni region of Vancouver Island, is standing in front of a mound of maps. He flips over page after page until he comes to the section on the Mactush Valley. The map he wants outlines the five-year cutting plan established in the Mactush by MacMillan Bloedel, a plan that was developed after the guidelines came into effect.

"Here's an example of the kind of thing we've been talking about," Mike says, pointing to a line representing a strip of timber between two logged-out patches in the forest. The strip, he explains, protects both sides of a creek draining into the Mactush.

"The original plan called for just one large cut block, with logging taking place right across the creek. We were concerned about that, and when we referred this map to the Fish and Wildlife people they sent back a note requesting that no trees or debris fall into that creek." You see, the Mactush is a salmon stream; any debris in the water could be harmful to the fish population.

"When we advised the company about the restrictions on logging across the creek, they decided not to log along that creek at all."

The accepted method of logging prior to the guidelines was a system known as progressive clearcutting (currently being re-christened successive clearcutting by industry). Basically, it consisted of an operator starting at one end of a valley and working his way up the watershed.

He moved ahead in stages, taking out approved blocks of timber of varying sizes, leaving some standing timber around that block, then jumping ahead to take out the next block. This standing timber around a cut block served primarily as a fire break, but in some cases the trees provided a natural form of reforestation.

As soon as the slash problem in the cut block was abated and the area restocked (usually in two or three years), the operator would return and remove the surrounding timber.

The road to the Mactush passed through the rather level parts of the Coos Creek Valley, where progressive clearcutting had gone on for years. The hillsides, despite the overcast day and elusive light, showed up in every possible shade of green. The older the trees the darker the hue, and in places the changes in shading seemed to climb the hillsides like a stairway to the mountain tops. In other places burnt stumps and jagged pieces of slash dwarfed the tiny trees growing up around them.

The guidelines put an end to progressive clearcutting, at least on paper, and a patch logging system was selected to replace it.

Essentially, patch logging is a system of separating cut blocks with wide patches of standing timber, and this standing timber is expected to provide the environment with its required protection. It acts as a permanent or temporary fire break; it guards against excessive run-off and erosion which might destroy both the hillsides and the fish in the streams below; it provides a habitat for wildlife (while regenerating cut blocks provide the feeding ground); and standing trees are always a potential recreational site for public use.

Originally, the cut blocks were to be limited to 200 acre openings, unless it could be shown that larger openings would not be harmful to the environment. However, as more site specific environmental studies are carried out, decisions on cut block sizes are now being made on the basis of what a specific environment can tolerate, rather than on the 200-acre guideline.

Although the guidelines seemed to appear on the scene with a rather dramatic flourish in 1972, they had really evolved out of two decades of thought and discussion on the question of ecologically sound logging. In particular, in the late 1950's in the Prince George area, Forest Service personnel and federal Fisheries representatives agreed to some early cutting guidelines for the protection of fish streams, streams feeding the salmon-rich Fraser River.

Later, these principles were to be incorporated formally into the Forest Service Management Manual.

"You might say these were the embryonic stages of the Coast Logging Guidelines," says Bill Bishop, District Forester of the Vancouver Forest District.

The practice of adjusting logging operations to take into account wildlife habitat came along about ten years later, when Forest Service and Fish and Wildlife personnel began discussions on the size and shape of cut blocks that would better accommodate the needs of wildlife. The results of these discussions, along with the earlier streamside protection measures, then served as the background for the 1972 guidelines.

The forest industry was jolted a little by the guidelines, especially the larger organizations that already prided themselves on conscientious logging practices. But with so many different companies operating in the forests, the Forest Service felt it was time to establish a single set of standards for everyone. Since then, the guidelines have been a popular topic of discussion with the industry.

David Turner, Vice-President of Logging at MacMillan Bloedel, gives his company's views on the subject:

"We certainly can't argue with the central philosophy of the guidelines," he says. "The other resources of the forest certainly have to be given serious consideration. But MacMillan Bloedel has its own Land Use Policy, one that was in effect even before the guidelines were introduced. This Land Use Policy would have protected the environment at least as well as the guidelines do, but at less cost to us."

It is a fact that for many years MB

(right)
This colour coded map outlines the five-year cutting plan for the Mactush Creek area. Pointed out is a section representing a strip of timber left to protect fish habitat.

(below)
A "wildlife corridor" near Mactush Creek. Usually placed vertically up the side of a mountain or steep slope, these areas allow game to travel from high elevations to lower areas.

"The sometimes rigid application of the guidelines has increased our costs considerably, and we don't always see any real benefit to the environment as a result of it all."

consistently demonstrated its commitment to responsible forest management and environmental protection by introducing many progressive practices prior to the introduction of the guidelines.

"The sometimes rigid application of the guidelines has increased our costs considerably," Turner says, "and we don't always see any real benefit to the environment as a result of it all."

In the years immediately following the introduction of the guidelines the forest industry experienced a rich foreign market for its products, enabling it to absorb whatever extra costs the guidelines might have caused them. Since then the lumber market has declined somewhat, and the cost factor of the guidelines is receiving a lot more attention.

However, only a handful of inconclusive studies has been done to try to pin down the extra costs the guidelines might be imposing on industry. It is an almost impossible figure to determine, as each logging site has to be evaluated separately.

Recently, field and headquarters staff of the Forest Service have been advised that there must be a practical application of the guidelines to ensure that economic factors are also considered when approving logging plans.

Today, industry spokesmen such as David Turner at MacMillan Bloedel, and Roy Sworder, General Manager of Logging for British Columbia Forest Products, agree that the Forest Service has become a little less rigid, perhaps a little more understanding, in interpreting the guidelines.

"And over here," Mike Wallace says, pointing with his pipe to another strip on the map, "is a wildlife corridor." "It runs up the side of the mountain to allow game to travel from high elevations to low elevations."

"In this case, once we had established the need for a game corridor we let the company select its location. This is what MB came up with."

"The idea always is to treat the guidelines as guidelines; not to enforce them as if they were regulations."

Although the forest industry has adjusted itself to the guidelines, and the Forest Service is giving admittedly more practical interpretations of them than before, the forest industry would like to see some major modifications. In particular, the industry is concerned with the issue of green-up, a term referring to the amount of time it takes a logged-over area to return to a stable condition.

Forest stability can involve many factors, some of which include wildlife habitat, slash abatement, erosion, and reforestation. Only when these factors have been accounted for is an operator allowed to take out the adjacent patches of standing timber.

Depending on the combined judgement of the ranger, the zone forester staff, and the district forester, green-up could take as long as 25 years. Ten to 15 years is not an uncommon estimate. Industry thinks the figure should be closer to the 3-year figure of progressive clearcutting days so an operator could finish work in a watershed in a shorter period of time.

Decisions on this issue (and on similarly important issues such as the size of cut blocks and the allowable percentage of a watershed to be logged at one time) are made according to the best professional judgement of the responsible Forest Service foresters. Whatever they decide will have a critical influence on both the costs to industry and the costs to the environment.

The road leaves the easy terrain of Coos Creek and begins to rise sharply. By the time it reaches the Mactush watershed it seems to be glued to the side of the steep slope, hundreds of feet above the narrow creek below.

Wallace finds a bulge in the side of the road and pulls over to let a fully-loaded logging truck squeeze by. Since they have stopped anyway, the four men decide to look at a near-by cut block. Besides Wallace there is Tony Teindl, forest ranger for the Port Alberni area; Bill Motyka, MB divisional forester; and John Mahon, MB divisional engineer.

Most of the trees in the area seem to be about knee high. Motyka and Mahon want to know if the area has greened up sufficiently. Two years ago MacMillan Bloedel had to defer a cutting operation in the area because of the green-up issue.

"It looks all right now," Wallace says, "but sometimes an area regenerates very sporadically. We'll have to walk around it first to be sure."

The road climbs into the watershed, hugging the steep slopes for dear life. At one point Wallace points to twin cut blocks across the valley. A tributary runs between them down to the Mactush, the same tributary Wallace had earlier pointed out on the map.

The guidelines are quite specific about procedures and techniques for logging around stream banks, but when the zone forester approves a particular logging plan, he pays close attention to any additional advice provided by the provincial Fish and Wildlife Branch and the federal Fisheries and Marine Service.

These two agencies, with their specific mandate to manage aquatic and animal life, are anxious to participate with the Forest Service in maintaining the ecological integrity of the forests.

Doug Morrison, Fish and Wildlife habitat protection biologist for Vancouver Island, says that the introduction of the guidelines has done much to improve the fish and game population of coastal areas. However, he feels quite strongly that there is still much more work to be done in this area.

Mike Brownlee at Fisheries goes as far as to worry that the guidelines, as they stand, may not be sufficient to protect aquatic values. On the other hand, he is emphatic about the positive effect the guidelines had on generating general environmental awareness amongst all forest users. He sees the guidelines as a major step forward in forest management.

However, a major problem with the guidelines, Brownlee points out, was their rapid implementation. Suddenly, companies had to rush

(left) Forest roads are necessary to extract timber resources. In many areas, the need to offer environmental protection by following natural contours and locating culverts to minimize erosion problems, results in unusually high construction costs. All construction costs are initially borne by industry. Eventually they are permitted to "write-off" these expenses from stumpage charges payable to the Crown.

"Essentially, the guidelines have served as a focus, a catalyst, around which the main forestry issues of the decade have been addressed."

through roads to the back of the watershed, and despite road building standards and common sense, the rapid rate of construction tended to cause serious ecological problems throughout that entire watershed.

The environmental problems associated with road construction, especially erosion and siltation of streams, are also taken up by Peter Pearse in his Report of the Royal Commission on Forest Resources. He winds up by recommending that fewer roads should be used more intensively.

Morrison at Fish and Wildlife agrees that the extra road building has upset certain watersheds, but it doesn't have to be that way, he says. He feels that industry should be more diligent when it puts through its roads, making sure to guard against erosion and siltation.

Clearly, he feels the benefits to fish and wildlife habitat, as a result of a patch logging system, outweigh the disadvantages of extra road construction.

And the debate over the Coast Logging Guidelines is far from complete. The resource agencies, the forest industry, and the Forest Service, each in their own way are wrestling with the question of the best way to manage the forest environment. In the last five years the discussions have not noticeably mellowed, but the substance of them definitely has become more refined.

In the first place, everyone agrees that the guidelines do not take into account the ecological differences from watershed to watershed. Everyone also agrees that as much as possible, logging decisions should be based on site specific information.

Added to that, the Forest Service has developed a second set of guidelines especially for logging at higher elevations. Also, they are in the process of turning out a comprehensive manual on stream side logging. No doubt more refinements will soon follow.

Essentially, the guidelines have served as a focus, a catalyst, around which the main forestry issues of the decade have been addressed. The answers to these questions are still being formulated as the dialogue on forest management and environmental planning continues. And often as not it is a painful process.

(above)
Comparing the coded logging plan with a near-by cut block is Mike Wallace and Tony Reindl, and Bill Motyka, John Mahon, from MacMillan Bloedel.

"And over here, for no other reason than the guidelines require it," says MB divisional engineer, John Mahon, "we were prevented from taking out that stand of timber."

"I'm sorry, John," says assistant ranger Mike Wallace, "but we never said anything about that timber. There's nothing preventing you from taking it."

"You never asked us about it," says forest ranger Tony Teindl.

"Well, based on the guidelines we just assumed you wouldn't allow us to log there," says MB divisional forester Bill Motyka.

The four men stare at one another for a long time before anyone speaks. Somewhere behind them a chain saw breaks for lunch.

"All you have to do is make a submission to us ..." says Tony Teindl. The other three nod their heads.

Then the four men squeeze themselves into the ranger vehicle, shoulder to shoulder, and head back to Port Alberni.

Words, Terms and Expressions

Integrated Resource Use is deliberate land management for two or more purposes. The land base is capable of supporting a variety of uses from recreational activities through to industrial development. Because the land is in limited supply and the demand for its use is increasing, public policy holds that greatest social benefits will occur when the greatest number of users have access to the land. In order to try to satisfy all users it may not be possible to get the maximum benefit from any one resource. In short, the total value of a combination of uses is considered more important than getting the best returns from any one use. Integrated use has to be considered in a temporal context as well as a geographic one. That is, integrated use may incorporate getting maximum benefit from single use for a given time period.

Primary Use is the use for which a land area is predominantly managed and which permits secondary, compatible, managed uses.

Secondary Use is a managed use other than the one for which the land area is predominantly (primarily) managed. The Ministry's recreation program results from the road access developed for logging. Timber production is primary, recreation is secondary.

Exclusive Use or Single Use is management for one purpose only, e.g. parks, ecological reserves, farms.

Incidental Use is a use for which a land area is not deliberately managed, but which occurs as a side benefit. Until recently, all hunting activities have been based on the incidental production of game due to logging. Now, wildlife management is being integrated with forest production.

Letters to the Editor

Letters to the editor provides an opportunity for our many readers to discuss topics arising out of ForesTalk, its contents, its aspirations, and its areas of interest. Letters for publication must carry name and address. Views published are not necessarily endorsed editorially.

Missing Acres

In your last issue of ForesTalk, the article "To Grow Beef You Need Grass" by Tony Gregson, states that "one quarter of B.C. is rangeland" and "there are some 23 million acres of cattle raising country spread out over B.C."

These statements are confusing when compared to the "Policy Background Paper" prepared by the "Task Force on Crown Timber Disposed — Forest Tenures in B.C." by Dr. P. Pearse in December, 1974.

Dr. Pearse reported there are 18 million acres of useable range of which 15 million acres were classified as forest land. He further stated there are 131 million acres of forest land in B.C. (56% of the province) and a total of 234 million acres in the whole province.

Thus according to Dr. Pearse, 18 million acres expressed as a percentage of B.C. is 7.7% not "one quarter" as stated in the article.

R. Kot
Victoria, B.C.

Tony Gregson's article obviously does not make sufficiently clear the estimate of one quarter of British Columbia's total land area as being rangeland represents potential rangeland, no matter how slim that potential may be. Much of the province's rangeland is forested so cattle must wander over a great many acres to find enough forage. Tony Gregson's figure of one quarter, therefore, represents any patch of ground, forested or otherwise, where cattle might find a mouthful of grass.

The figure of 23 million acres differs from the Pearse report because it was only last year that rangeland from other sources, such as the Federal government, has been included. This figure has been consistently revised upward. At one time it was as low as 13 million acres. It is now 23,500,950 acres, and this year will be about 24 million.

Editor

Balanced viewpoint

We have been enjoying your magazine for some time, but are just now asking to be put on your mailing list.

You are doing a worthwhile service to this province in raising the general awareness of the forestry "agribusiness". There are so many conflicting demands on the forests, it must be rather difficult to give us a balanced viewpoint, but you seem to achieve this admirably.

Eleanor Carr-Harris
Vancouver, B.C.

Wants to help

I really enjoy ForesTalk, especially the last issue. You manage to include such an interesting variety of topics. Your article on "Environmental Education" was excellent. I believe each and every school throughout Canada should have some form of program to ensure students have access to this type of education. Many of my friends have never experienced the thrill of watching a mink in its natural habitat. I'm fortunate that our family enjoys camping and often has the opportunity of seeing wildlife. As a student, just going into grade 11, I realize I only have 2 years to go, and I'm out in the "big" world. Since I can remember, I've always wanted to help people become aware of our forests and wildlife, and the need to conserve and maintain them for future generations. A Forest Ranger or a naturalist in a provincial park seem to be vocations which could help me reach my goal. Could you please direct me to sources for this type of information.

Susan Lawson
North Vancouver, B.C.

For specific information regarding qualifications and employment opportunities, write: Forest Service Personnel Division, Ministry of Forests, Legislative Buildings, Victoria, B.C. V8V1X5, or Personnel Officer, Ministry of Recreation and Conservation, Legislative Buildings, Victoria, B.C. V8W1E8.

Editor

After reading the advertisement in your July issue of ForesTalk, I was wondering if you could supply us with some of your posters. I could supply an excellent place to hang them. What better place than a hospital's X-ray department where people are continuously waiting with nothing better to do than stare at the blank walls? What a chance for your Ministry to inform a large cross-section of the public of your programs.

C. Smith, R.T.E.
Chilliwack General Hospital

We can learn from nature

Thank you for the Fall copy of ForesTalk. It is a delightful magazine and I have learned a great deal about the forests, wildlife and generally the great outdoors of British Columbia since I started to receive ForesTalk quarterly.

Ms. Lemon's article on The Beaver, in the Fall Issue is most enlightening and reminds us that man can still learn much from nature. I was amazed to read in Tony Gregson's article that it takes up to 100 acres to sustain a cow and her calf during the summer months on rangeland in British Columbia.

When I finish with my copy of ForesTalk, I send it to nieces and nephews in Ireland and some of them have had commendations from their teachers for assignments written from information obtained by using ForesTalk for reference.

A. Cotton
Vancouver, B.C.

Schools, teachers and students

I found the last two issues of ForesTalk very informative and interesting. The publication should do much to inform young and old of the complex relations between the forest industry, agriculture and other natural resources. Having been most interested in conservation education in the schools, I was wondering, is ForesTalk distributed to schools in the province? It contains excellent material for term papers.

C. Hensely
Victoria, B.C.

ForesTalk is mailed free of charge to all elementary, secondary, public, private and Indian schools throughout the province.

Editor

I enjoyed your last issue, especially the article on Environmental Education. I felt, however, that the comment "some universities even offer university credits for environmental courses", was out of place. I completed the environmental education course through Simon Fraser University last summer, and I can assure you that we earned that university credit through hard work and learning, which cannot always be said of "university credit".

Carol Radcliffe
Penticton, B.C.

. . . and from our younger readers

I enjoyed your last magazine on Cows. I never knew much about cows until now. Could you please send me some of your posters. I didn't want to make this letter long. My mom says you have lots of work to do.

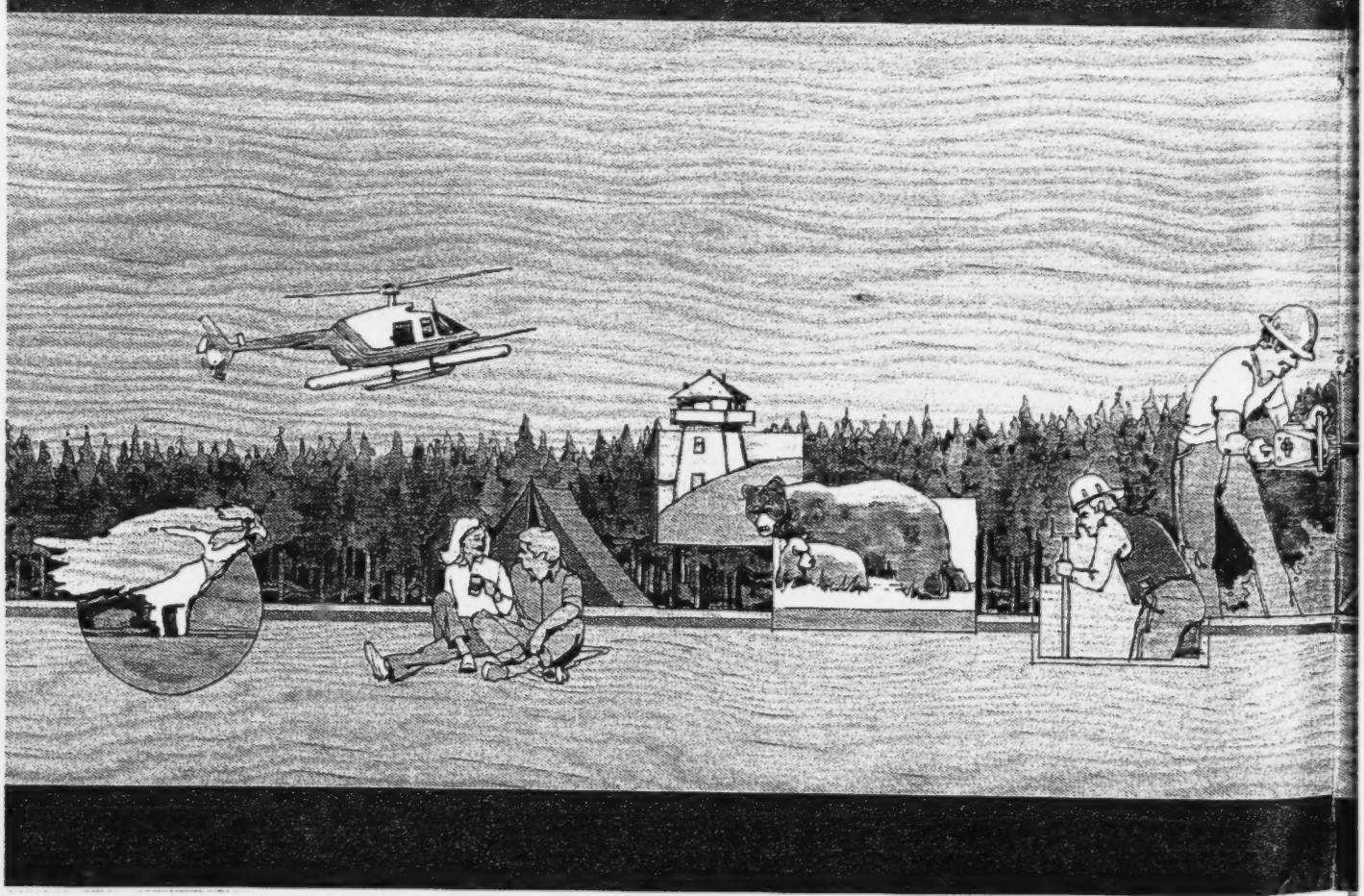
Ronald W. Lutzke
Peachland, B.C.

Planning for Tomorrow

Fortunately, unlike oil, coal, copper and other minerals, our forests are renewable, and it's the Ministry of Forests' responsibility to keep it that way. You might say a "continuous crop — forever".

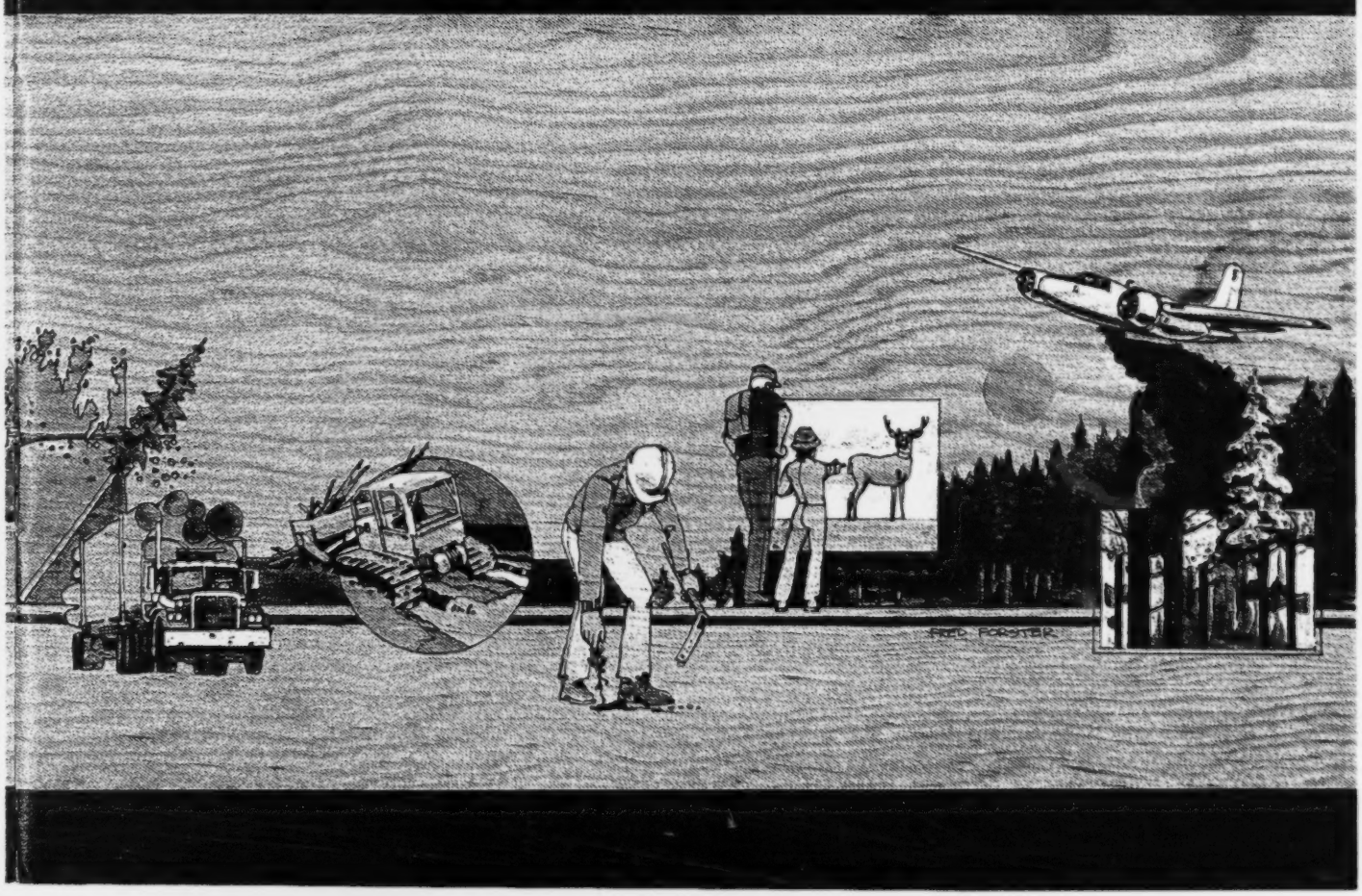
That goal, coupled with the needs of other users of the forest, is the beginning of two concepts called "Sustained-Yield Forest Management" and "Integrated-Use Resource Management".

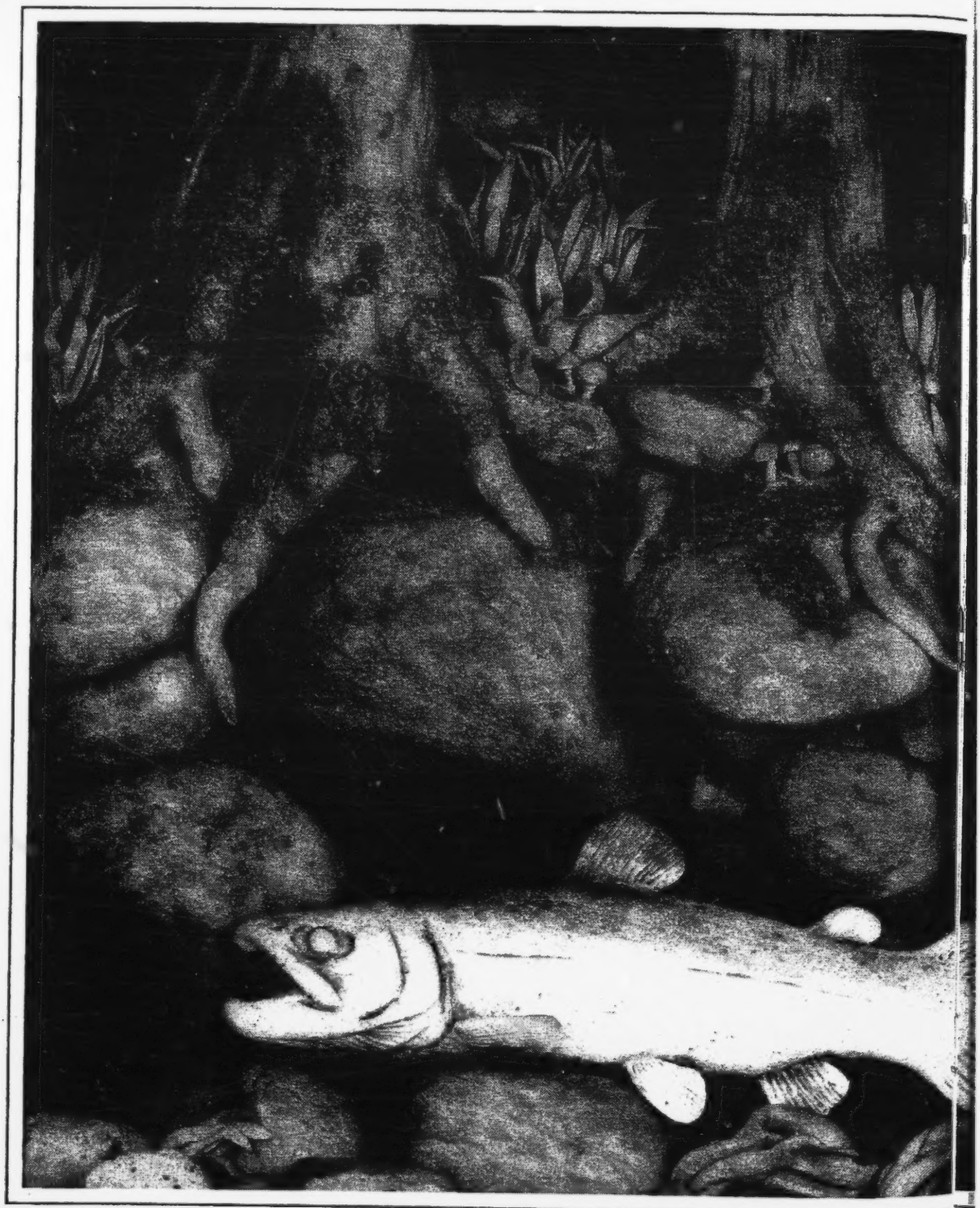
The key elements of these concepts, carefully planned, controlled, and co-ordinated with the forest products industry, are:



- Taking an inventory of all resources. The volume, quality and type of wood fibre is measured. With other agencies, we record soils, streams, wildlife, watersheds and high use recreation areas.
- Protecting the crop from fire, insects and disease.
- Building development roads, bridges and transportation systems in preparation for the harvest.
- Developing and continuously re-assessing environmental guidelines to minimize adverse impact on the forest resource.
- Harvesting the mature crop. In most cases, like wheat or corn, the trees are harvested in blocks. This encourages maximum use of the wood fibre and permits efficient reforestation with trees that grow best in full sunlight.
- Preparing the ground after the harvest. Slash and debris are removed when necessary, clearing the land for the next crop.
- Breeding better forests. Both government and industry are involved in research programs. It's all part of an effort to grow a better kind of tree. One that's taller, straighter and more disease resistant than its ancestors.
- Growing new forests. Each year, over 75 million seedlings are grown in Forest Service nurseries. These seedlings are grown from seed taken from cones from superior trees. Each seedling is returned to a reforestation site of the same elevation from which its parents came.
- Planting the new crop. In highly productive sites and areas where nature is having difficulty, the ground is returned to growing trees as soon as possible.

The end result of all our efforts is stronger, better, faster growing trees, producing more usable wood fibre, at the same time protecting the forest resource for its other users.





Streamside Logging

'Tailor-made Solutions' to individual problems.

by **Gord Price** *photography by* Kim Martin and Keith Moore

Opinions on forest management are like trees. There are always new branches sprouting. Unanimity is as rare as a palm tree among the Douglas-firs.

So when the Select Standing Committee on Forestry, an all-party sampling of provincial politicians sat down in the spring of 1973 to hear points of view on the sticky question of streamside logging, they probably expected the cacophony that characterizes so much discussion about the forests. What they heard was quite a remarkable consensus.

"No single, all-embracing solution for streambank protection should be legislated," declared the Council of Forest Industries. "Blanket, iron-clad provisions for greenstrips along all streams should **not** be adopted," concurred scientists from the Pacific Biological Station. "Protective practices must be tailored to the values to be protected," argued MacMillan Bloedel, who found themselves in agreement with the Fish and Wildlife Branch. "Flexibility in application is required if logging and fishing are to co-exist," stated the branch's brief.

Soil and water are the elements of a forest ecosystem. From them, all else flows — particularly trees and fish. To manage one part means to respect the other, and so, as the politicians concluded in their report, "the question of streambank logging cannot be separated from the whole question of integrated resource management because any disturbance in any part of a watershed can have a profound effect on other parts of a watershed."

(left) The ceramic sculpture, "Trout Under Cover," by Neil Dalrymple, illustrates in graphic form the extremely close relationship between the forests and fisheries resource.

Everyone agreed, it seemed, that the integrity of the aquatic environment must be protected when harvesting soil-based resources, which was definitely an improvement over the days when the industry failed to acknowledge the existence of other users or the damage insensitive logging was inflicting on the fisheries. But the questions remained: how should this be done?

The temptation was to set down an all-purpose requirement for a standard greenstrip — a width of trees and understory running along both sides of the stream. It was very quickly recognized, though, that the components of a suitable protective strip varied so greatly that an inflexible regulation was too rigid.

To illustrate the complications and considerations involved, take a look at the list of basic reasons for streamside protection, (see page 21) a list that results from the decades of research and observation undertaken by fisheries, forestry and wildlife personnel who battled to prove that the stock of salmon in the ocean could be affected by logging in some far-away mountain valley. Further research modified some of the original thinking which suggested the all-purpose prescription of greenstrips, particularly ones requiring the preservation of merchantable timber. These considerations are presented in the right-hand column.

Consequently, there is no regulation requiring a greenstrip in every case, although the coastal guidelines recognize that some types of forest cover should be preserved, such as "tree growth occurring on unstable, erodible cutbanks; leaning trees along water courses and shorelines which

Tailor-made Solutions

No two timber harvesting areas are the same. This is especially true when streams having a fish habitat potential are involved. What species of tree is being harvested? Is there fish in the stream? Do they require shade? Must the water be kept unusually clear? Will harvesting cause erosion problems because of unstable soil? Is the area a prime recreation/wildlife area? There are a great number of considerations which must be examined before they become major problems. Solutions must be tailor-made.

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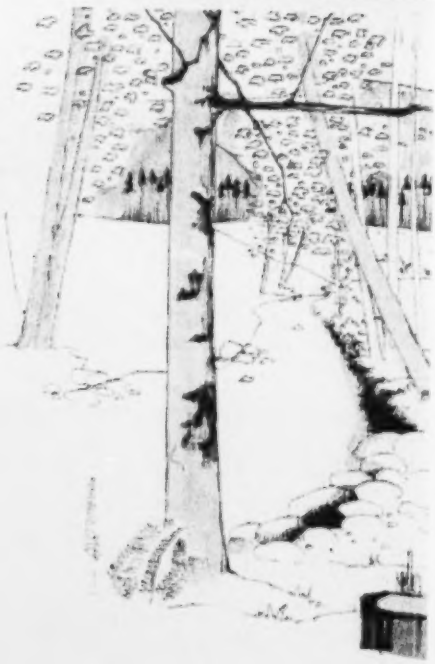
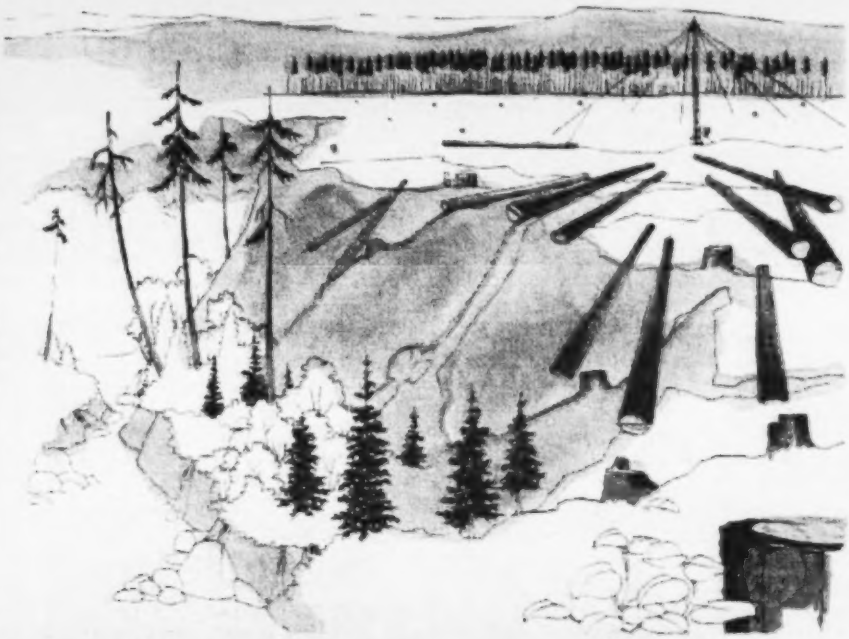
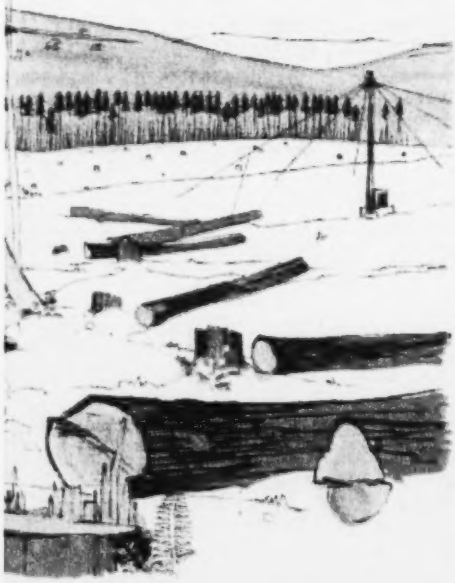


1 On this small fish stream, special care has been taken to ensure the banks were not damaged and logging debris did not enter the stream. In this area, any large trees left would probably have blown down. Special falling and yarding techniques are used to remove streamside timber without damaging the stream.





3

2 Valuable conifers have been harvested along this streamside, but deciduous trees such as alder have been protected to provide shade and a supply of insects for fish in the stream.

3 Along this important fish stream, a fringe of coniferous and deciduous trees has been left. They are windfirm and serve several useful purposes such as prevention of erosion, shading, etc.

cannot be removed without causing environmental damage;" and, as a guide, they recommend that "at no time during the phase will two cut openings be permitted to face each other across a perennial stream" unless the maintenance of other resource values has been approved.

In addition there are also protective clauses included in a tenure licence or cutting permit, particularly what is known as 'P1'. Its nine subsections can require the licencee to avoid depositing debris in streams (also prohibited by the Federal Fisheries Act), the removal of obstructions, protection from slash burning, construction of landings for logs no closer than two chains to the stream, proper bridges and culverts for high water, the prohibition of operations within the high water mark, and the yarding of trees away from the banks and shores except when otherwise designated.

In a typical planning situation, the forest company would first determine the presence of a fisheries resource through federal escarpment records or fish and wildlife data. They might even inventory streams in inaccessible areas themselves. After taking into account coastal guidelines and contractual obligations, they'll draw up a report to submit to the respective district forester who will then refer it to other provincial agencies — fish and wildlife, water resources, etc. — for their opinions. In some particular cases, the data may be included in the folios for a specific watershed.

After the requirements are incorporated into the cutting plan, the district forester will then issue a cutting permit which ideally will incorporate the necessary protection strategy for the specific resources to be maintained. In special cases, there may even be some attempt to enhance the potential of, say, a salmon stream for greater benefit of other users.

Over time an informal consensus has been worked out by resource managers and industry. The reality seems to be this: wherever there is a fisheries resource, the integrity of the streamside will be maintained by preserving the deciduous trees and understory. The merchantable timber will be removed in almost all cases, except in isolated instances where other needs have clear priority or physical difficulties with the site preclude logging.

Hence the discussion among industry and resource managers is largely about logging techniques needed to remove large timber with minimum damage. This may simply involve falling timber away from the stream (although that's often not so simple or safe for the faller). It may mean placing a choker high up the tree so that it can be pulled away from the water after it's cut. It may mean that leaners over the water course are felled and left behind to prevent problems associated with blowdown. In other words, a specialized form of logging has to be practiced. Unfortunately, it is often difficult to get companies to use the techniques and equipment required to remove the merchantable timber without damaging the stream or streambank.

The main areas of contention are over logging on steep slopes, especially when there is no plan to protect the stream from debris coming down from above, and cross-stream yarding. The latter, although requiring less roads, less costs and less equipment, can disturb the streambed and banks while leaving behind debris.

Currently some informal experiments are underway to examine the results of cross-stream yarding when carefully done in appropriate environments. "If it is done above fish water," explains Doug Morrison of the Fish and Wildlife Branch, "with low gradient and no fish enhancement potential, we'll allow cross-stream yarding to see the amount of debris left behind and silt created."

Another area of argument, as usual, is over costs. The Council of Forest Industries maintains that, "Those costs that are incurred specifically for streambank protection should be borne by the beneficiaries of this protection." Some, like Hugh Clifford, recognize the argument for mitigation of timber lost. Others like Bill Otway of the B.C. Wildlife Federation note that though the forest industry has been a major cause in the destruction of the fisheries over the years through poor management, they have not contributed directly to help pay for restoration or enhancement programmes, estimated to cost $150 million over the next decade. Bev Evers of the Sierra Club suggests that the question should really be: "What are the savings of proper management? Benefits will outweigh the costs, although in the short run it will cost more to manage the resource properly."

A project currently being developed by Keith Moore in the Research Division of the Forest Service may offer a solution to the problem of evaluating a proper cutting strategy for a diversity of sites. First begun as a thesis, 'A Decision-Making Procedure for Streamside Management on Vancouver Island' presents a routine, consistent method for site-specific evaluation.

Soon to be published, it breaks down streams into those with 'users' — including the fish — and those where water quantity is the only concern, usually on steep gradients. By identifying the physical characteristics and the value of streamside vegetation, an appropriate logging strategy can then be chosen so that "the harvesting of streamside timber (can be done) in such a way that the non-timber resource values are maintained at acceptable levels."

Actual field testing in 1976 revealed problems with consistency of interpretation, and there have been criticisms by some companies related to time and costs involved, but there is almost universal agreement that the procedure does offer the opportunity to solve the biggest problem related to streamside management — making the right decision on site at the right time to benefit most of the users most of the time. ◘

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Reasons for a Greenstrip ... and other Considerations

1. Shading

High temperatures caused by removal of trees can be detrimental or even fatal for many species of fish, often leading to disease or replacement by coarser species.

Removal of streamside canopy can also result in a temperature fall in winter causing emergence problems for fish.

To provide for the shading needed to prevent overheating or temperature fluctuations, the best arrangement is a combination of tall trees, small trees and shrubs.

Coastal streams in particular are sometimes too cold and would be more productive if less cover allowed more solar radiation to warm them. Some temperature increase may lead to more food growth.

Angle of the river relative to the sun and topographic shading are also important.

Merchantable timber may not necessarily be required for effective shading.

2. Stabilization of the Streambank

Vegetation and tree roots help prevent erosion, slumping and sedimentation. They help hold the soil on the streambank in place and prevent it from slumping into the stream after logging, as well as stabilizing against bank cutting.

Decadent timber, unstable trees and leaners are vulnerable to blowdown eventually, though they do not affect the stream the same way that logging can. Immediate replanting with grasses can reduce erosion to some extent, but not significantly.

Streams do change course on their own, carving out new beds.

3. Food

Up to two-thirds of the food for fish can come from the insects which feed on overhanging branches, roots exposed by cutbanks and other streamside vegetation.

Streamside cover provides protection for both fish and its predators who feed at streamside.

The most important sources of food are alder and salmonberry, deciduous vegetation which can be left while the mature coniferous trees are removed, assuming the stability of the bank is retained. Logging can provide new growth and increase food supply. But because alder is considered a problem if it spreads to adjacent plantations and retards the growth of Douglas fir, it is sometimes removed, resulting in a loss of food source.

4. Filtration

Logging activity, especially road construction, creates sediment which can be carried to streams by surface runoff. Sediment then clogs spaces between gravel, resulting in reduced oxygen exchange and removal of waste products, and even suffocation of eggs. Increased turbidity means less food production. Heavy sedimentation can scour stream bottoms.

Removal of the streamside vegetation will intensify this. Greenstrips also significantly reduce the erosive effects of rain.

Greenstrips have limited affect in reducing sedimentation carried in runoff since once the sediment is in a water channel it goes right through a greenstrip. Proper logging management, particularly in road layout and construction, is critical in reducing sedimentation.

5. Debris Protection

Greenstrips will protect streams from large debris produced by logging. If logging is taken right down to the banks, branches and trees that fall into the stream can prevent orderly movement of the salmon, deplete the water of oxygen, scour the bottom and banks, and release toxic phenols from decay. Large log jams will force the stream to cut new channels.

The infrequent blowdown of the leaners or decadent timber can provide resting places for fish.

Greenstrips are frequently vulnerable to blowdown, blocking the stream and leaving a worse mess than if the timber had been logged. Cleanup afterwards is expensive, dangerous and often impossible.

6. Regulation of Water Flow

Greenstrip vegetation and floor litter has some regulating effect on water flow and peaking periods through evaporation, transpiration, interception of rain and snow, the drip effect of fog and cloud, and moderation of temperatures.

High peak flows after logging can cause gravel shifting and increased erosion of banks.

Peak flows caused by logging are less significant than climate, soil and other physiological factors. Increased flows can increase fish yield in some cases by permitting the fish to run higher upstream and enlarging the area of spawning beds.

7. Protection from Sprays

Greenstrips reduce the amount of toxic material that ends up in the water.

Closely regulated and carefully applied sprays should not have a detrimental effect on aquatic habitat or water purity.

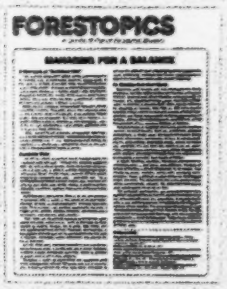
8. Aesthetics and Recreation

Part of the pleasure of angling, hiking, canoeing, etc. along streams and rivers is the canopy that encloses the user and shields the views of logged-off areas. A greenstrip with the mature timber removed has considerably less appeal.

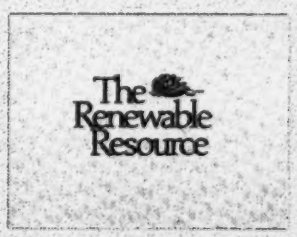
The initial ugliness of logging is moderated after a decade as greenup progresses.

BOOKS POSTERS & PAMPHLETS

Who We Are and Where to Find Us is a new booklet and as the name suggests, it outlines for you the services and locations of the offices in the Ministry. It is a valuable tool for those who come in contact with the Ministry for industrial or recreational needs. Included is a colourful map of the Province illustrating the different forest districts used by the Ministry.



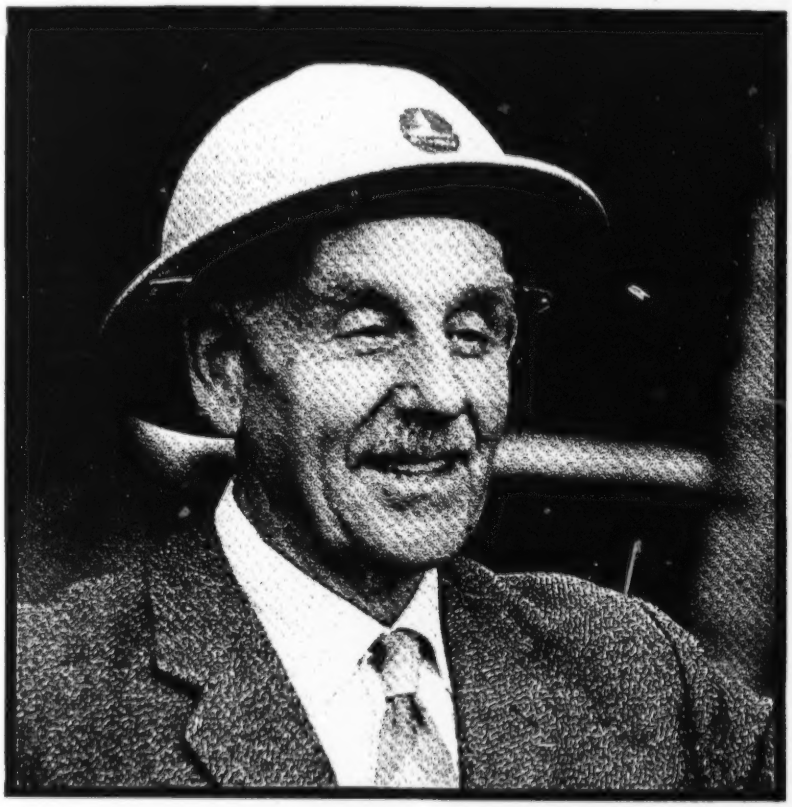
Forestopics is a new type of fact sheet, covering all phases of forest management. Each Forestopic will cover the details of one topic in clear, understandable language. Excellent for teachers or interested individuals. Send in your name, address and postal code. You will receive copies as they are published.



The Renewable Resource is a brief look at the concept of "integrated resource-use forest management". This full colour booklet takes you on a journey through the world of maps, wildlife, computers, trees and most important, the many people working behind the scenes to keep British Columbia's forests healthy and productive.

All publications are free. Please print your name, address and postal code.
Write to: Publications, Ministry of Forests, Parliament Buildings, Victoria, British Columbia, V8V IX5

People



Gerry Wellburn

by **Ray Wormald**

He's like a terrier with a bone. A collector, he's obsessed with preserving the history of British Columbia's largest industry.

His first car ride was a miserable experience.

There were no doors in front where he sat. His legs were too short for his feet to reach the floorboards and his backside got awfully sore as the hard-wheeled vehicle bounced over the rough country road.

It was the summer of 1907 and Gerald E. Wellburn was seven years old. He remembers thinking: "The wretched things will never last!" Even at his tender age he was fascinated by trains . . . they might have been a bit noisy, but they provided a faster and smoother ride.

Little did he realize that some decades later he would be involved in a personal struggle to preserve the last few remaining logging locomotives in the province.

His prediction about the future of the automobile was probably the only real "goof" of this otherwise perceptive and successful businessman who today can look back over 78 years of variety-filled work, adventures and challenges. And true to his nature, Gerry Wellburn is still active and intensely interested in the world around him.

His life started in Scarborough on the northeast coast of England, and he's proud of the fact his birthplace was close to that of England's famed navigator-explorer Capt. James Cook. His father had a grocery store business, which had been in the family since 1812.

Lured by the promise of adventure and opportunity in the new world, the Wellburn family sailed from England in 1911, train travelled wide-eyed over "miles and miles of nothing but miles" from Halifax to Vancouver, stayed there a brief while, then settled in Victoria.

Although things like jobs and income were still some years ahead of him, young Gerry as a school boy in England had always worked for his spending money. "My first job," he

recalls, "was tossing hay during my summer holidays, and the pay was really something ... three pennies a day. And I had to walk two miles to and from the job."

A paper route with the Victoria Daily Times led to his first post-school job with the circulation department of that evening newspaper. It meant numerous trips up and down Vancouver Island to mining centres and logging camps. It was at the (then) booming timber town of Chemainus that Gerry rode in the cab of his first hissing, steaming, logging locomotive.

He turned 18 as World War I neared its end, and not being too enthused about prospects of life as a foot slogger in the army, he applied for service with the Canadian Flying Corps. His interim "war effort" saw him going to work with the Victoria Foundation Co., building wooden ships and using air tools for the first time. "It was an exciting job ... but that's about all, "Gerry reflects, "but it seemed to me there wasn't much of a future in wooden ships."

His boyhood fascination for trains persisted, and after wrestling with air tools in the shipyard, the young Wellburn had a dream come true: he started work with the CPR in the Okanagan. He took advantage of every opportunity to ride "up front" with the engineers, and to hear Gerry recall the experience, "you haven't lived until you've chugged and snorted your way through the Selkirks on a clear, crisp night."

Two big events struck the world in 1918. "The war to end all wars" ended; and a deadly flu epidemic struck most countries. "It hit Canada hard ... many people died."

It hit Gerry Wellburn too. He was in the Vernon Hospital when the war ended. He never made it into the flying service.

He returned to Victoria, and to the newspaper business. But the city was not the same. With the war over there was unemployment ... "and for a time the whole place just seemed to stagnate. It was no place for a young man."

In 1921 Gerry married Ethelmay Heatcote, a Victoria girl, and the following year they moved up-island to Comox. The logging business wasn't exactly booming, but he saw a future in British Columbia's vast coastal timber stands. A long and colorful career commenced when he started work with Tom Gwilt's Gwilt Lumber Co. and Bevan Lumber Co., with operations in the Comox Lake region.

Although his job was primarily pushing paper, Gerry was pleasantly close to his favourite big hunks of hardware — locomotives. And even better, logging locomotives. He spent about five years with that outfit and a highlight was during a winter shut-down he helped an engineer completely dismantle and then overhaul a "loci".

As his training, experience and knowledge grew, so did his desire to get deeper into the timber business. The export of B.C.'s top quality wood was expanding, and that prospect appealed to him. But he needed some practical training, so he went to New Westminster to join the Robson Brothers' Timberland Lumber Company — an exporting firm. It operated a logging camp at Ladysmith on Vancouver Island, and Gerry's career got him back to his favorite island at frequent intervals. By early 1928 the "magnetic pull" of Vancouver Island became irrestistible and the Wellburns moved back to Comox.

Then the railway "influence" emerged again. There was a fast-developing demand for railway ties in England, and feeling his time of independence had come, Gerry moved a few miles south to Duncan.

In that area he saw great expanses of uptapped, high grade timber and late in 1928 the firm of Wellburn Timbers Ltd. was born. But the tall trees blocked the view of the dark economic clouds which were starting to shadow the world.

Within a year it happened. All overseas railway tie orders were cancelled. As the veteran timber man recalls "the whole world seemed to dissolve overnight." The Great Depression had started.

It was his ingenuity, determination and experience that enabled Gerry and his company to survive. Business and life in general developed into a constant struggle. But he won the uphill fight and as the world emerged from the great slump, his business expanded steadily. His timber firm worked under contract to the (then) H.R. MacMillan export company. In 1942 the larger firm bought out the Wellburn holdings and kept Gerry on its books as a divisional manager for the next 25 years.

Tremendous changes took place in the forest resource industry soon after World War II, and among those changes was the replacement of logging railways by trucks. (It was ironical that Gerry Wellburn was among the pioneers of truck logging.) Before his very eyes he saw many railways completely abandoned, or worse yet, locomotives being cut up for scrap and shipped to steel-hungry plants in Japan.

To this day Gerry remembers one of his uppermost thoughts of that time: "We must save the story of this great industry."

In the early 1940's he actually prepared a list of all the bits and pieces of hardware which made up the logging industry of those earlier years — locomotives, donkey engines, steam tractors, the first clumsy things they called bulldozers, long cross-cut saws, double-bitted axes and a host of other logging paraphernalia. Early in the 1950's he systematically started his collection ... a project which has continued to this day.

It's another long and interesting story, but today that vast reflection of yesteryear's chapter of the province's logging industry is all together at the British Columbia Forest Museum, located near Duncan. It covers 100 acres, and since its opening in 1964 has attracted about half a million visitors from all over the world.

Standing nobly at the museum entrance is a 40-ton "shay" geared locomotive which snaked its way into Vancouver Island's timber stands back in 1911 for the (then) Bloedel Stewart and Welsh Co.

It figured that Gerry Wellburn should do something like this ... all his life he has been a collector. A stamp collection which commenced in his boyhood days has developed into a display which has won many international honors. He doesn't talk much about that collection; or about an impressive array of classic old cars he and his son Vernon have accumulated and maintained in running order over the years.

Unique, indeed, are some of the ways by which the great collector acquired many of his museum exhibits. Some were purchased outright, some were donated, while others ... "well, let's just say almost every item has its own story."

He's still helping to expand and improve the forest museum he founded, and his search for collectibles will never end.

"He's like a terrier with a bone," observed one of his forestry friends, "once he gets his teeth into something he just won't let go!"

And you know, that's about the finest compliment anyone could pay Gerry Wellburn.

Damaging Dead-Heads

By Jean Sorensen
photography by Barbara Davies, Steve Seaton, Dennis Woodske and Jim Challenger

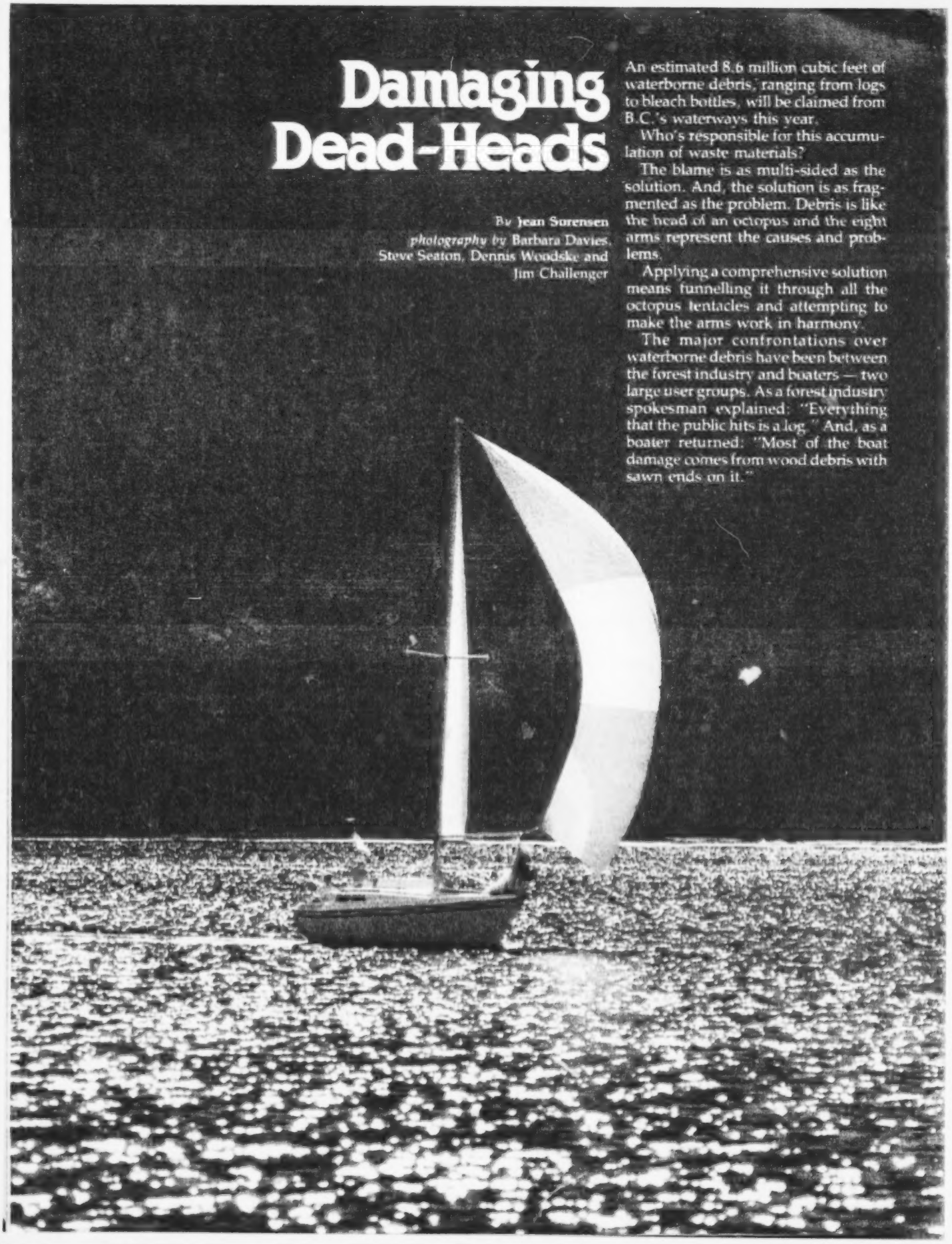
An estimated 8.6 million cubic feet of waterborne debris, ranging from logs to bleach bottles, will be claimed from B.C.'s waterways this year.

Who's responsible for this accumulation of waste materials?

The blame is as multi-sided as the solution. And, the solution is as fragmented as the problem. Debris is like the head of an octopus and the eight arms represent the causes and problems.

Applying a comprehensive solution means tunnelling it through all the octopus tentacles and attempting to make the arms work in harmony.

The major confrontations over waterborne debris have been between the forest industry and boaters — two large user groups. As a forest industry spokesman explained: "Everything that the public hits is a log." And, as a boater returned: "Most of the boat damage comes from wood debris with sawn ends on it."



While user conflicts have clouded the issue, unified funding from the provincial and federal governments has been slow in developing. The Ministry of Forests, on behalf of the provincial government, contributed significantly during 1975 and 1977, but support from the federal government, under whose auspices coastal waters fall, has been largely token.

Dissidents may argue the use of federal and provincial funds for clean-up, claiming it is a forest industry problem. Statistics, however, undermine the argument.

In 1971, the Ministry of Forests carried out an extensive study on a number of rivers and boating areas. The Ministry classified debris into three categories: natural, 37%; man-made, 32%; and saw-logs, 31%.

Natural debris is described as whole trees, stumps, or limbs that have been washed into the system, while man-made debris encompasses a raft of materials abandoned by boaters or residents who still picture a waterway as a natural garbage disposal system. Saw-log debris was attributed to the forest industry and included merchantable wood, bobbing post-like deadheads, low-lying sinkers, and logging debris that escapes from sorting areas.

The problem breaks down into one of people, industry, and nature.

The Council of Forest Industries, (an association representing the major B.C. forest industries), launched a task force study in 1974 in response to the growing public outcry aimed at its members. The study, among other things, advocated the formation of a joint industry, provincial, and federal government debris board. Known as the Interim Debris Board, it was established three months later.

The board's first year budget was a mere $87,000 which snared 50,000 cubic feet of debris and salvaged 4,000 deadheads. A year later, the program's impetus rounded up 850,000 cubic feet of wastewood and 15,000 deadheads at a cost of $241,000. The program dropped back its budget to $141,000 in 1976 when the Ministry of Forests' funding of a boom was halted to consider the construction of a new and more efficient one. The Ministry has pledged $150,000 this year and the Fraser River boom should be operative by early spring of 1978.

To the end of 1976, the board's $470,000 in contributions came 65% from the forest industry, 25% the provincial government and 10% the federal government.

This year, the largest contribution came from the Ministry of Forests in the form of the boom funding. Board Chairman Mike Painter estimates the 1977 total budget at $292,500 with industry contributing $115,000 while the federal government has volunteered $27,500 to cover administrative costs.

Of the $115,000 coming from industry, $100,000 — paid semi-annually — comes from Gulf Log Salvage Co-operative Association. Gulf Log is government regulated, but, operated and owned by the forest companies. It acts as the depositing station for salvaged logs. The board payments are profits, usually divided among co-op members, derived from log sales in the No Mark Visible (NMV) fund.

Contributions of this type from industry have come under criticism in the findings of the Pearse Royal Commission on Forest Resources.

Commissioner Dr. Peter Pearse, a University of B.C. economist, reports: "Certainly, it seems inappropriate to maintain a system in which debris control is subsidized from salvaged logs, while logging companies — which cause most of the problem — receive financial gains from salvors' operations."

Under Gulf Log's method of operation, the salvors receive a percentage of the full value of logs turned in. There are two scales; one applying to logs with a clear company stamp and a second higher pay scale for logs which fit into the NMV category.

Dr. Pearse says in his study that although it is an offence to obliterate a logging company's stamp, this double rate structure encourages defacings. A report prepared by the Northwest Log Salvors estimates that less than 10% of salvaged logs bear any identifiable timber mark.

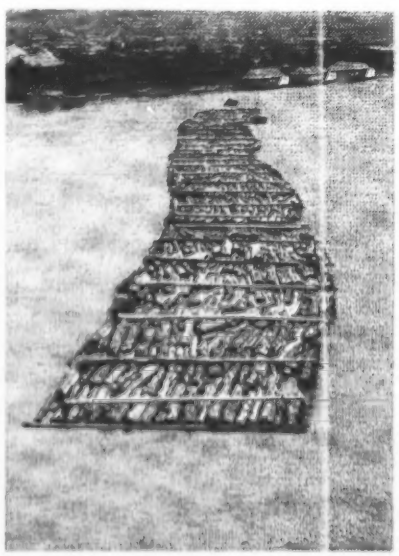
Dr. Pearse has recommended a review of the co-op's operations and advocated that salvors receive full market value for their turned in logs — a measure which would cut into the profits of the co-op members.

To encourage industry to guard its logs more closely, Dr. Pearse has suggested a $5 to $10 surcharge for each company log salvaged.

The proposal is considered to have a hefty clout with at least one B.C. forest company.

"We don't actually favor having to pay this penalty, but, we can't say he is wrong in suggesting it," says Nel-

Log booms are still a common site along B.C.'s coast.



son Rainbow, manager of Ravonier Canada (B.C.) Ltd.'s log trading department.

"There is nothing that industry pays more attention to than log costs."

The penalty would put the emphasis on log loss instead of the clean-up process, Rainbow says.

A timber company that has been almost a pioneer in debris control is the Tahsis Co. Ltd.

Bob Milholm, manager of Tahsis' raw materials division, was one of the 1975 debris board delegates who came away from meetings disturbed over the industry's actual losses.

"We, as a company, immediately established stricter regulations for debris control, escapement of logs and waste material."

The company's efforts also included rigging side-winders (oneman boom boats capable of moving sideways) with a debris catching grid. As logs were sorted for tow, the scooped-up side-winders zipped back and forth picking up loose bark and wood chunks.

Since the Tahsis Co.'s operations on the west coast of Vancouver Island, the Nootka Sound, do not fall within the confines of Gulf Log, the company hired seven salvors to bring in all waterborne wood. Two salvors are salaried, and the other five are paid on a salvage rate that makes no distinction between debris and saw logs.

"Each company has an individual responsibility to control debris despite the efforts of COFI which works on behalf of the industry as a whole," Milholm says.

Painter thinks that the debris board's efforts have resulted in a decrease of river and Howe Sound debris. But, while it may be noticeable to the program co-ordinators, it has not reached the point where the public's highly critical eye would necessarily recognize it.

Making a further dent on debris will depend on expanding the current program. The Ministry of Forests control boom, to be installed near Laidlaw on the Fraser River, will be a major step in controlling freshet debris next spring. The two-mile long boom will funnel all debris and logs into a backwash area for utilization or burning after the run-off.
ing after the run-off.

Don Cameron, a construction engineer with the Ministry of Forests, says the new control boom will replace a 1975 government rented boom. The older boom, belonging to a commercial towing company, broke and the cost of repairing it was almost as costly as constructing a new one. After a lapse in 1976, the Ministry of Forests announced this year the allocation of $150,000 to fund the new boom.

Long range plans for debris control also includes encouraging the federal government to take more financial responsibility. At one point, Painter had projected federal government contributions to $217,150 for 1977, but only $27,500 has been donated.

"I'm badgering the federal government to come through with at least $150,000," Painter says. During past years, the federal funds have come through the Ministry of Fisheries and Environment. But, it has basically been a good will gesture, Painter feels. In the future he would like to see changes in the Navigable Waters Protection Act, which would place the responsibility of debris control under the federal Ministry of Transport.

This hefty financial support and a strong commitment from the federal government would place the board in a position to work on a three-year plan — a necessity if debris control is going to be effective, Painter says.

Painter has drawn up a tentative plan covering 1977 to 1979, but mainly

This old log which has washed up onto the shores of one of the Gulf Islands, still has the company's timber mark stamped on its end.

because of lack of federal support the estimates are already off. It is an indication, though, of the type of spending that Painter sees industry and the two levels of government doing.

The plan, starting in 1977, called for commitments of $217,150 from the federal government, $151,250 from the provincial government and $151,250 from the forest industry; in 1978 respectively, $111,715, $206,450, and $206,450; and in 1979, $50,000, $206,450, and $206,450. The decline in the 1976 budget figures are due to a reduction in capital spending. After the tin boom is brought in, an additional disposal site and catch basin is slated for 1978 at costs of $61,715. No work has been slated for 1979.

Scaled down on a financial level, the expenditure of each dollar by the board can mean a cost-saving to the public of at least two dollars or more. Statistics show that damage to fishing and pleasure boats from water-borne debris is between $800,000 and $1.5 million a year.

There are additional costs that haven't been calculated into that figure. Boaters are facing increased insurance deductibles which underscores the growing seriousness of water borne debris.

Deductibles have climbed from an average $25 to $250, says Joseph Lawson, editor of Prop Wash, the publication of the Pacific Mainland District of the Canadian Power Squadron. The increases are clear indications that insurance companies are no longer going to pay minor $30 and $40 prop damages.

Gabriola Island trustee Terrance Hanna is an individual who if not unhappy with the concept of the debris board, is impatient to have its coverage extended to outlying areas such as his.

"All the money is spent in the Fraser River or Howe Sound areas," he criticizes. "These are highly visible areas to the general public."

Boaters from smaller, less populated areas, should have the same claims to unspoiled waters and beaches, Hanna says.

"There are hundreds of small coves with beautiful white sand that no one can use because they are covered with debris," he says.

He emphasizes another point — the threat of an oil spill.

A tentative site for the Ministry's $150,000 control boom has been chosen near Laidlaw. Negotiations and discussions are presently being held with property owners and government agencies. Hopefully, final decisions will be reached, allowing the Ministry to construct the boom for the 1978 spring freshet.

(right)
Modern 'dryland' sorting operations reduce log loss and provide protection to delicate environmental areas.

(below)
Improvements in transportation such as the 'Haida Monarch', a self-loading barge, is helping to reduce the amount of logs lost during their journey from the forest to the mill.

A familiar site along British Columbia's coastline, beachwood is an old and perpetual problem. Despite clean-ups, sweeps, controls and booms, floating debris will always find its way to our shorelines, like it has done for hundreds of years.

"God forbid that we have any type of oil spill and it gets onto the beaches and debris. We'll have to burn everything and the beaches will be black with cinders."

Like it or not, Painter maintains that water-borne debris is a permanent problem. Nature, man, and industry will continue to contribute despite clean-ups, sweeps, controls, booms, and patrols.

The forest industry has attempted to bundle logs to decrease log losses. It is estimated that by 1980, of the one billion cubic feet of wood moved by water, three-quarters will be bundled, Painter says.

Of the remaining 25%, about 10% or less cannot be bundled because of the site location of limited water depths.

"We are often asked why we can't unload the logs from the barge right onto the land near the mill?" Painter says. Again, it is a case of marrying two different types of technology. Mills were designed to receive wood from the water and in some cases there would not be the readily accessible land available to store logs. A more immediate problem is that mills may not have the draft of water needed to bring a barge in.

The questions, the hunt for funds, the planning are all part of the work that the joint board is doing. Painter points out that the board has not launched a major publicity campaign lauding its progress — mainly because the work is only in the embryo stage."The program is just starting to crystallize." ◘

COLLECTIONS

Edited by Michael Gregson

Early Fires Established Today's Forests

Fire has been a major factor in the distribution of trees in our forests. Certain species, called "pioneer" species even appear sympathetic to disturbances (earthquakes and landslips included) because they are shade intolerant and need to have the forest "opened up" to reproduce well. Lodgepole pine, interior spruce and Douglas-fir are notable species of this type.

The presence of huge stands of lodgepole pine and interior spruce all the same age, indicates that enormous fires have occurred in British Columbia in pre-settlement times. Probably all the province was burned at one time or another.

On the Coast, dendrochronologists (dendrochronology: the study of tree rings) have found that huge fires burning 310 and 410 years ago were probably responsible for the establishment of most of the high-value Douglas-fir now existing. These fires were truly gigantic, involving 2,000,000 acres on Vancouver Island alone.

Other major fires occurred on the island 150, 560, 760 and 870 years ago.

Education, the most vital of all resources

All history — as well as all current experience — points to the fact that it is man, not nature, who provides the primary resource: that the key factor of all economic development comes out of the mind of man. Suddenly, there is an outburst of daring, initiative, invention, constructive activity, not in one field alone, but in many fields all at once. No one may be able to say where it came from in the first place; but we can see how it maintains and even strengthens itself: through various kinds of schools, in other words, through education. In a very real sense, therefore, we can say that education is the most vital of all resources.

— E.F. Schumacher,
Small is Beautiful, 1973 Harper & Row, N.Y.

Forest Facts

In 1970, wood and its derivatives (methanol, gas, and charcoal) supplied 7 percent of the world's total energy consumption — more than three times the energy generated by hydroelectric power.

Over 80 percent of a living tree consists of water drawn from the ground by its roots.

Approximate proportions by weight of the main elements in wood: carbon, 50 percent; hydrogen, 6 percent; oxygen, 44 percent, and a trace of nitrogen.

Manufacturing a ton of lumber requires 453 kilowatt-hours of electrical energy. A ton of steel requires 3,780 kilowatt-hours, a ton of aluminum 20,160 kilowatt-hours.

British Columbia covers about 234,100,000 acres, and nearly 60 percent (136,700,000) is forest land. Ninety-five percent of this forest land is publicly owned and under the management and protection of the Ministry of Forests.

A strong and mature Douglas-fir can withstand winds up to 90 miles an hour. And on a warm summer day this tree will consume hundreds of gallons of water.

The first commercial sawmill in British Columbia was built in 1846 at Parson's Bridge near Victoria.

British Columbia is the only province in Canada producing red cedar shingles and shakes. The popular cedar species is found in commercial quantities along the west coast of the province.

You're wrong if you think plywood is something relatively new. It dates back to early Egyptian times and was used by Pharoah's artisans as early as 1500 B.C. for decorative purposes.

World's Largest Logging Truck

The largest logging truck in the world is the "Mk V" — fifth in a line of huge off-highway carriers developed and owned by Butler Brothers of Vancouver Island. With truck and pup trailer fully loaded, the Mk V has grossed 300 tons. Unladen it weighs 80 tons. Unlike many other species of big trucks, the Mk V is a long haul vehicle, meaning that fully loaded it can move quickly, reaching speeds of up to 50 m.p.h. The cost of developing this truck was approximately $250,000.

Fabled Giants

The lack of historical data on trees from the hey-day of big tree logging has enabled certain big tree myths to persist telling of trees outsizing the known record holders of today.

Best known of these giants is the "Carey Fir" cut in the late 1800's in Lynn Valley by George Carey. This Douglas-fir is said to have been 417 feet high.

Certain photographs in the Provincial Archives suggest other unsubstantiated giants. One depicts a Douglas-fir measuring 14 ft. 4 inches at its stump. Felled in 1886, the tree grew at the intersection of Georgia and Granville streets in Vancouver.

Too little, too late

In self interest, Canadians must create the new knowledge needed to increase their outdoor recreational opportunities, reduce pollution, improve water yields, and manage wildlife on forest lands in responsible association with greatly increased growth and harvest of sustained crops of timber ... Canada's forest resources influence are of direct concern to most Canadians. Yet research into how to use them wisely and more completely often appears to be too little and too late.

— H. G. Smith and G. Lessard,
Forest Resources Research in Canada,
Background Study for the Science Council of Canada, 1971.

Basic Ideological Problem

The problem of how we may live in harmony with our forests is the problem of controlling men's narrow and linear purposes so that they will not destroy the circular ecosystems to which contemporary humans remain as indissolubly bound as were their ancestors of a million years ago. If we are to live in harmony with our forests and ecosystems, we must restore and maintain their circular ecological structure. Such restoration and maintenance in turn requires the restoration of circular structure in our social and political systems, so that the feedback of information concerning the states of social and ecological variables from the public and from the environment to regulatory agencies is assured. The problem of how to live harmoniously with our forests is not a problem in forestry. It is, rather, a set of social, economic, political, conceptual, and even ideological problems. Their solutions are not to be sought through simple changes in forestry practices. They are to be found in changes in the organization of our thought and of our society.

— Roy A. Rappaport,
CoEvolution Quarterly, Winter 1977
"Forests and the Purposes of Man."

Tallest/Oldest/Largest

The unverified 417 foot height of the "Carey Fir" easily dwarfs the known record holder, a Douglas-fir cut by Woss Lake on northern Vancouver Island. Only 385 years old, this tree was 305 feet high.

A Douglas-fir dropped in 1959 in the Cowichan Valley of Vancouver Island is the oldest known tree. With a stump 12 feet across, it was 1,266 years old.

The largest recorded butt belonged to a western red cedar. Its diameter was 18 feet.

Current record figures of trees in British Columbia might not stand for all time. A good chance exists that individuals of yet greater age and size remain to be found in our forests, while old super-timber-loggers rarely bothered to keep information on the giants of their day.

Value of B.C.'s Wood Products

The value of output from the forest industry has been equal to the combined value of outputs from all the other primary resource industries.

Wood products consistently make up approximately 60% of total British Columbia exports by dollar volume.

The majority of British Columbia's output of wood products are exported; approximately 75% of sawmill production; 60% of pulpmill production; and about 70% of paper mill production.

In 1976, about 5.9 million tons of pulp were produced. This output represented an increase of 35% from output level of 4.3 million tons in 1975.

Employment in the Wood Products Industry

Over 10% of the total provincial work force is engaged in the forest (primary and secondary) industry.

In the primary forest industry, employment in 1973 was about 23,000. In 1975, employment had declined to about 17,400 (due to work stoppage). In 1976, when market demand increased from the previous years low level, employment increased to about 21,700.

About 90% of the people engaged in logging or harvesting trees actually "move" the logs and only 10% actually perform the felling and bucking operations.

FOREST HABITAT

Mushrooms Toadstools & Fungi

By **Enid K. Lemon** *photographs by* Enid K. Lemon, Nancy Turner and Barbara Davies

There has always been considerable confusion as to when a mushroom is a toadstool. The general idea has been that mushrooms are edible and toadstools poisonous.

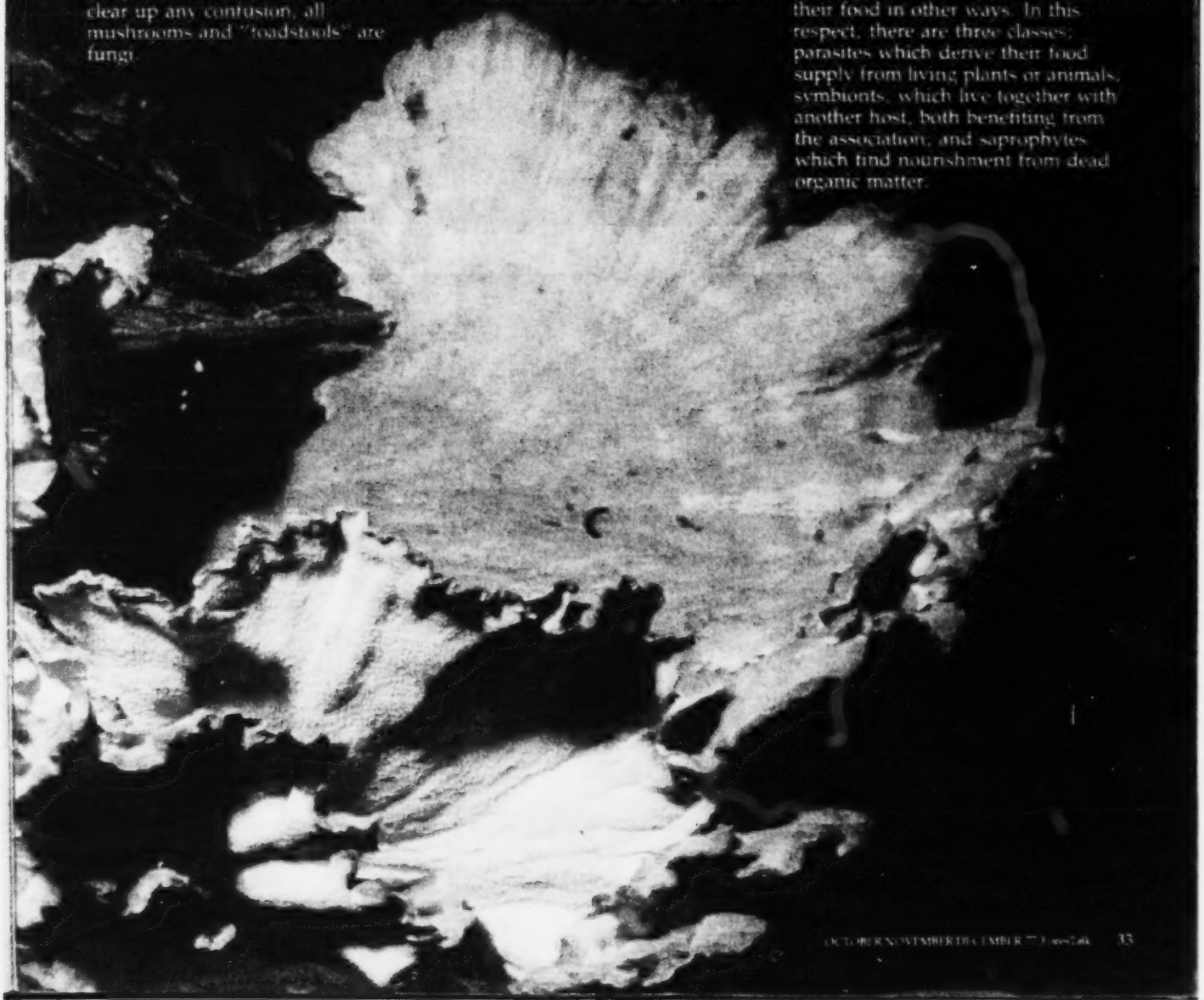
The origin of the word "toadstool" is unknown, and has no scientific meaning. It is thought to have sprung from an Old English version of the word "tad(e) stole" — the name for toad being "tadde". Country folk believed toads were venomous, and as they had the habit of sitting on mushrooms they therefore transmitted their poison to the plant — hence "toadstools". To clear up any confusion, all mushrooms and "toadstools" are fungi.

There are an estimated 200,000 species of fungi in the world ranging in size from the giant puffball, weighing up to 28 lbs. to those that can only be seen with the aid of the microscope. They can cause "jungle foot" — the nightmare of the soldiers in the jungles of Asia during World War II — and provide several antibiotic wonder drugs. As to their edible qualities, they range from palatable to delicious to deadly.

Fungi reproduce themselves through spores, vast numbers of them. The mushroom purchased in the super-markets would produce somewhere in the neighborhood of a million spores, and of course the larger the species the more spores they produce.

If weather conditions and habitat are favorable the spore will germinate and a complex mass known as mycellium is formed, from which a new crop of fungi will appear. Few of the vast numbers of spores find ideal conditions, which is fortunate. If they did, the forest floor would be swamped with fungi.

Fungi are a vast class of simple plants lacking chlorophyll. Unable to photosynthesize, they must obtain their food in other ways. In this respect, there are three classes; parasites which derive their food supply from living plants or animals, symbionts, which live together with another host, both benefiting from the association, and saprophytes which find nourishment from dead organic matter.



Parasitic fungi are numerous. This group includes the stem rust of wheat, which, until a resistant strain was produced, caused millions of dollars worth of damage to the wheat fields of the Prairies. The rusts affecting the pines of this Province are also parasitic. But not

Amanita Pantherina

all fungi in this group are pests. Consider yeast for bread, wine and beer making. Many cheeses such as Blue Danish owe their distinctive taste to a species of parasitic fungus. Probably the most important member of this group is the life saver penicillin.

Unfortunately the forester has to contend with many species of fungus which attack our trees. The honey agaric mushroom *(Armillaria mellea)* which is a parasitic root rot fungus, is very common in British Columbia. The fruiting bodies, which incidentally are edible, grow close together often on a rotting tree stump. From this source the mycellium is provided with rhizomorphs, which are a thread-like structure, looking rather similar to a black shoe lace. These rhizomorphs can grow through the soil for many yards from the infected tree and infect a perfectly healthy one.

This same fungus in Japan forms a beneficial association with a leafless orchid, the fungus inhabiting the root of the plant. This is not a parasitic arrangement but a beneficial one as the orchid is dependent on the fungus to live.

Another very troublesome root rot fungus is *Phellinus (Poria) weirii*, which is widespread throughout the province and is causing much concern in the Douglas-fir plantations. This damage is spread in the same manner as the honey mushroom. Another parasitic fungus, *Polyporus schweinitzii*, (velvet top) attacks mature Douglas-fir and Sitka spruce usually through basal wounds which can result from fire.

Echonodontium tinctorium, which gets its common name "Indian paint fungus" from the brick-red fruiting bodies that form on living trees usually where a branch is attached to the trunk. This fungus, which is only known in Japan and North America, is one of the causes for an enormous annual loss of timber through decay. It has been estimated that interior stands of mature and over-mature hemlock may have losses up to 30% of the gross cubic foot volume.

White pine blister rust *(Cronartium ribicola)* had been an indigenous disease in Europe but had caused very little trouble, until the early 1700's when some eastern white pine was introduced to Europe. This species is very prone to the rust so the disease became rampant. Unfortunately in the early part of this century, it came to North America on imported eastern white pine nursery stock. In 1910, the rust was introduced to western Canada on imported stock and spread rapidly to the very susceptible western white pine. This fungus requires host plants, such as gooseberry or currant to complete its rather complicated life cycle.

Control of this disease has been difficult. Early promise of success

Wild Gooseberry

White pine blister rust.

with antibiotic chemicals did not materialize. Silvicultural methods, pruning and eradication of all currant and gooseberry plants within a stand have had limited success. But probably the most hope lies in the breeding of rust resistant white pine seedlings. In 1950, the U.S. Forest Service commenced a study of the few trees that remained free from the disease while those around were heavily infected with the rust. Seeds from stands, that have sustained very high mortality — 80 to 90 percent from the rust, have produced healthy seedlings. It is from these sources that much genetic work is being carried on.

In British Columbia, practically all stands of less than 60 years and more than 15 years old are affected by the rust. In younger and older stands, the incidence is less. Dr. R.S. Hunt of the Pacific Forest Research Centre is working on the genetic variation in resistant trees, as well as other aspects of control for this very destructive disease. The scientists are hopeful that in the foreseeable future, white pine will again be able to be planted in our forests.

The classic example of the symbionts is the lichen, which is an association of a fungus and an alga. The fungus forms a leaflike structure over a large number of algal cells. The fungus supplies the attachment as well as gathering the food material, whether it be from a tree trunk or rock, that the algae with its chlorophyll uses in the manufacture of food for both.

One of the saprophytes that attack trees is Polyorus sulphureus, the sulphur fungus, another of the

bracket or conk fungus. Although the tree may be standing or fallen, living or dead, the mycellium only digests and destroys the dead heartwood.

Saprophytic fungi are very important to man, as they reduce dead plants and animals with the help of bacteria to make new soil, without which life would cease to exist. It is from this group that most of the edible mushrooms come.

There have been many suggestions as how to determine whether a certain fungus is edible or poisonous. The illustrious Mrs. Beeton, whose cook book was the bible of English cooking, said if you put a silver sixpence in the pan in which you were cooking the mushrooms and it turned black, the species was poisonous. Another belief claimed if the cap peeled it was edible. This is entirely erroneous as the Death cap (*Amanita phalloides*) peels very easily, and is deadly poisonous! Equally incorrect is the assumption that all poisonous mushrooms change color when bruised. Delicious lactarius (*Lactarius deliciosus*) — one of our very best edible species — turns green when bruised.

During the summer and fall there are a number of cases of mushroom poisoning which need immediate hospital attention. The usual cause of the poisoning is a mushroom called Panther agaric (*Amanita pantherina*), which is abundant throughout the Pacific Northwest, where you find it in open coniferous forests and even on your lawn.

Panther agaric is highly toxic and contains mycoatropine which affects the nervous system, together with varying amounts of muscarine which reduces the pulse rate.

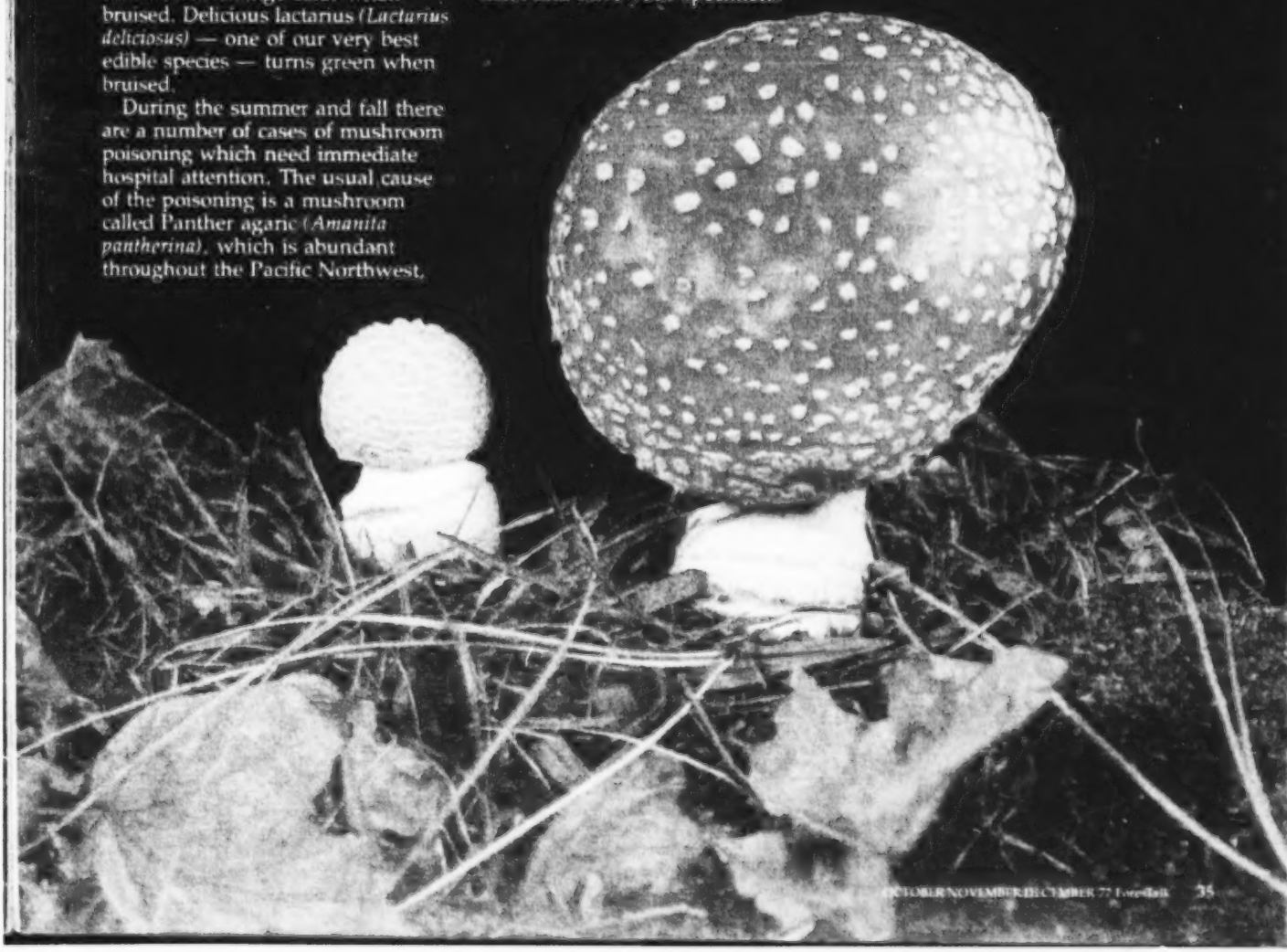
This mushroom derives its name from the panther-like spots or "warts" on its cap. Remember, avoid mushrooms with these danger signs — white "warts" on a brown or tan cap — white-gilled specimens having a stem up to five inches long and a swollen base.

The forest floor is a great source of food supply for many delectable mushrooms. But there is a danger in "pothunting". Only eat those that are easily recognizable. In this connection it is suggested you contact your local Natural History Society, which will have members with a knowledge of mushrooms. If you cannot find such a society, write to the Federation of B.C. Naturalists, Box 33797, Station "D", Vancouver, B.C. V6J 4L6, who will be able to meet and have your specimens identified. It is not unusual to find more than 100 different species in a few short hours of searching.

In Europe much more use is made of the edible mushrooms than in Canada. In fact a delegation of visiting Russian Foresters were almost more impressed by the numerous different species of mushrooms in the forest than by the trees!

There are numerous books on mushrooms, from a rather expensive, but well illustrated volume called "Mushrooms of North America" by Orsen K. Miller Jr., published by E.P. Dutton and Co. Inc., New York, to the inexpensive "Guide to Common Mushrooms of British Columbia", by R.J. Bandoni and A.F. Szczawinski, Handbook 24, British Columbia Provincial Museum. This is an excellent handbook, with colored illustrations.

The world of the fungi is well worth exploring. It holds something of interest for both the scientist and layman alike.



ForesTalk

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